

Service Manual

ViewSonic VG2230wm-1

Model No. VS11422

22" Color TFT LCD Display

(VG2230wm-1_SM Rev. 1a Oct. 2006)

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Revision History

Revision	SM Editing Date	ECR Number	Description of Changes	Editor
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TABLE OF CONTENTS

1. Precautions and Safety Notices	1
2. Specification	4
3. Front Panel Function Control Description	14
4. Circuit Description	20
5. Adjustment Procedure	24
6. Troubleshooting Flow Chart	56
7. Recommended Spare Parts List	64
8. Exploded Diagram and Exploded Parts List	67
9. Block Diagram	71
10. Schematic Diagrams	72
11. PCB Layout Diagrams	78

1. Precautions and Safety Notices

1. Appropriate Operation

- (1) Turn off the product before cleaning.
- (2) Use only a dry soft cloth when cleaning the LCD panel surface.
- (3) Use a soft cloth soaked with mild detergent to clean the display housing.
- (4) Use only a high quality, safety approved AC/DC power cord.
- (5) Disconnect the power plug from the AC outlet if the product will not be used for a long period of time.
- (6) If smoke, abnormal noise, or strange odor is present, immediately switch the LCD display off.
- (7) Do not touch the LCD panel surface with sharp or hard objects.
- (8) Do not place heavy objects on the LCD display, video cable, or power cord.
- (9) Do not use abrasive cleaners, waxes or solvents for your cleaning.
- (10) Do not operate the product under the following conditions:
 - Extremely hot, cold or humid environment.
 - Areas containing excessive dust and dirt.
 - Near any appliance generating a strong magnetic field.
 - In direct sunlight.

2. Caution

No modification of any circuit should be attempted. Service work should only be performed after you are thoroughly familiar with all of the following safety checks and servicing guidelines.

3. Safety Check

Care should be taken while servicing this LCD display. Because of the high voltage used in the inverter circuit, the voltage is exposed in such areas as the associated transformer circuits.

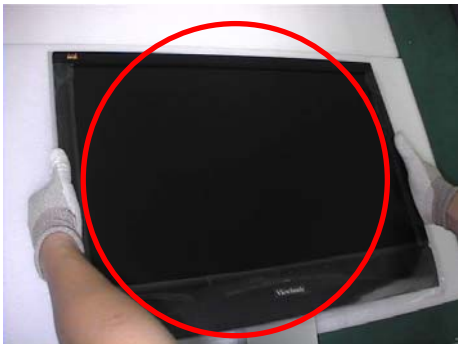
4. LCD Module Handling Precautions

4.1 Handling Precautions

- (1) Since front polarizer is easily damaged, pay attention not to scratch it.
- (2) Be sure to turn off power supply when connecting or disconnecting input connector.
- (3) Wipe off water drops immediately. Long contact with water may cause discoloration or spots.
- (4) When the panel surface is soiled, wipe it with absorbent cotton or other soft cloth.
- (5) Since the panel is made of glass, it may break or crack if dropped or bumped on hard surface.
- (6) Since CMOS LSI is used in this module, take care of static electricity and ensure human earth when handling.
- (7) Do not open or modify the Module Assembly.
- (8) Do not press the reflector sheet at the back of the module in any direction.
- (9) In the event that a Module must be put back into the packing container slot after it was taken out of the container, do not press the center of the CCFL Reflector edge. Instead, press at the far ends of the CFL Reflector edge softly. Otherwise the TFT Module may be damaged.
- (10) At the insertion or removal of the Signal Interface Connector, be sure not to rotate or tilt the Interface Connector of the TFT Module.
- (11) After installation of the TFT Module into an enclosure (LCD monitor housing, for example), do not twist or bend the TFT Module even momentarily. When designing the enclosure, it should be taken into consideration that no

bending/twisting forces may be applied to the TFT Module from outside. Otherwise the TFT Module may be damaged.

- (12) The cold cathode fluorescent lamp in the LCD contains a small amount of mercury. Please follow local ordinances or regulations for disposal.
- (13) The LCD module contains a small amount of materials having no flammability grade. The LCD module should be supplied with power that complies with the requirements of Limited Power Source (IEC60950 or UL1950), or an exemption should be applied for.
- (14) The LCD module is designed so that the CCFL in it is supplied by a Limited Current Circuit (IEC60950 or UL1950). Do not connect the CCFL to a Hazardous Voltage Circuit

Correct methods :	Incorrect Methods :
Only touch the metal-frame of the panel or the front cover of the monitor. Do not touch the surface of the polarizer .	Surface of the panel is pressed by fingers & this may cause “ MURA “
	
	
Take out the monitor with cushion	Take out the monitor by grasping the LCD panel. That may cause “ MURA “.
	
Place the monitor on a clean & soft foam pad .	Place the monitor on foreign objects . That could scratch the surface of panel
	

2. Specification

2.1 INSTRUCTION

1	LCD PANEL (1 st source)	Panel: Size Pixel Arrange Glass Treatment Contrast Ratio Viewing Angle Colors Luminance Response Time Backlight Backlight Life Mercury	CR >= 10 On-Off	CMO A220Z1 22" Wide Color a-Si TFT Active Matrix 1680X1050 LCD 0.282 mm x 0.282 mm Anti-Glare, Hard coating (3H) 700 :1 170/160 (degrees; typ) 16.2 million colors (6+2 bits) 280 cd/m2 5 ms 4 CCFL 60000 Hrs (Typ) / 50000 Hrs (Min) 3 mg per lamp
3	INPUT SIGNAL	Video Sync		RGB Analog (75 ohms, 0.7 / 1.0 Vp-p), DVI (TMDS, 100 ohms) Separate Sync / Composite Sync / SOG Fh = 24 – 82 kHz ; Fv = 50 – 85 Hz
4	COMPATIBILITY	PC Mac		PC Compatibles (from VGA up to 1680X1050 Non Interlaced) Power Mac (up to 1680X1050)
5	RESOLUTION	Recommended Support		1680x1050@60Hz 640 x 350 @ 70Hz 640 x 400 @ 60, 70Hz 640 x 480 @ 50, 60, 67, 72, 75Hz 720 x 400 @ 70Hz 720 x 480 @ 60Hz 720 x 576 @ 50Hz 800 x 600 @ 56, 60, 72, 75Hz 832 x 624 @ 75Hz 1024 x 768 @ 50, 60, 70, 75, 75Hz 1152 x 864 @ 75Hz 1152 x 870 @ 75Hz 1280 x 720 @ 50Hz 1280 x 768 @ 50, 60, 60, 75Hz 1280 x 960 @ 50, 60, 75Hz 1280 x 1024 @ 50, 60, 75Hz
6	AUDIO	Speaker		2.5Wx2
7	CONNECTORS	Video Power	Analog Digital	DB-15 DVI-D Internal Power Adapter, 3-pin plug (CEE22)
8	POWER	Voltage		AC 100-240V (Universal); 50/60 Hz

		Packing (W x H x D)	Standard Packing	570 mm (W) x 530 mm (H) x 300 mm (D) 22.4" (W) x 20.1" (H) x 11.8" (D)
15	WEIGHT		Net Gross	6.6 Kg (14.5 lbs) 8.6 Kg (18.9 lbs)
16	REGULATIONS			UL, CUL, FCC-B (ICES), CB, CE, TCO'03, ICES-003B, ISO13406-2, TUV/GS, TUV ERGO(covers ISO13406-2 & MPRII), TUV-S, NOM, GOST-R, HYGIENIC (20 copies), ENERGY, Energy Star, CCC, BSMI, PSB, C-TICK, KTL/MIC, SASO, WEEE, RoHS
17	RELIABILITY	MTBF		100,000 Hr (Excluding Panel).
18	POWER SAVING FUNCTION	"On" " Active Off"	GREEN AMBER	Normal ≤ 1 W
19	LOGISTICS	Container Load Pallet Load UPC Code Serial Format EDID Code Country of origin	20' / 40'	240 / 520 pieces 20 pieces 766907228816 QC9 Byte 10 – 0 x 1E, Byte 11 – 0 x A2 CHINA
20	Wall Mount	VESA		100mm x 100mm
21	OTHERS			DDC/CI, KENSINGTON MicroSaver Security Compatible, WorldWide Model.
22	Package Contents	LCD Display Power Cable Video Cable Audio Cable Quick Start Guide ViewSonic Wizard CD-ROM		
23	EU Packaging Information	Carton -- One piece construction with double wall, 1.0 Kg Plastic Handle -- PE-LD, 13.2g Poly Foam -- EPS, 180g, 2 pices Accessory Plastic Bags -- PE-LD, 2g The PE bag that cover monitor -- PE-LD, 3g Pallet (Europe) -- Poplar, 28Kg Pallet (Others) -- Fumigation wood, 30Kg		

2.2 GENERAL SPECIFICATION

Test Resolution & Frequency	1680x1050 @ 60Hz
Test Image Size	Full Size
Contrast and Brightness Controls	Factory Default: Contrast = 70%, Brightness = 100%

2.3 VIDEO INTERFACE

Input Connector (refer the Appendix A)	Analog = DB-15 Digital = DVI-D
Default Input Connector	Defaults to the first detected input
Video Cable Strain Relief	Equal to twice the weight of the monitor for five minutes
Video Cable Connector Pin out	Refer to Appendix A; Compliant DDC/2B
Video Signals	Video RGB (Analog) Separate Sync / Composite Sync / SOG TMDS (Digital)
Video Impedance	75 Ohms (Analog), 100 Ohms (Digital)
Maximum PC Video Signal	950 mV with no damage to monitor
Maximum Mac Video Signal	1250 mV with no damage to monitor
Sync Signals	TTL
DDC/2B	Compliant with version 3
Sync Compatibility	Separate Sync / Composite Sync / SOG
Video Compatibility	Shall be compatible with all PC type computers, Macintosh computers, and after market video cards
Resolution Compatibility	Refer to Segment 4-5
Exclusions	Not compatible with interlaced video

2.4 POWER SUPPLY

Internal Power Supply	HJC H0AU032001
Input Voltage Range	90 to 264 VAC
Input Frequency Range	47 to 63 Hertz
Short Circuit Protection	Output can be shorted without damage
Over Current Protection	5.0 A typical at 12.0 VDC
Leakage Current	3.5mA (Max) at 254VAC / 60Hz
Efficiency (at 115VAC Full Load)	Typical: 80% Minimum: 75%
Fuse	Internal and not user replaceable
Power Output	38 Watts (typ)
Ripple and Noise	Ripple: <3% Noise: <1%

Max Input AC Current	1.5 Arms @ 90VAC, 0.75 Arms @180VAC		
Inrush Current (Cold Start)	50 A (max) @ 115VAC 90 A (max) @ 230VAC		
Power Supply Cold Start	Shall start and function properly when under full load, with all combinations of input voltage, input frequency, and operating temperature.		
Power Supply Transient Immunity	Shall be able to withstand an ANSI/IEEE C62.41-1980 6000V 200 ampere ring wave transient test with no damage.		
Power Supply Line Surge Immunity	Shall be able to withstand 1.5 times nominal line voltage for one cycle with no damage.		
Power Supply Missing Cycle Immunity	Shall be able to function properly, without reset or visible screen artifacts, when ½ cycle of AC power is randomly missing at nominal input.		
Power Supply Acoustics	The power supply shall not produce audible noise that would be detectable by the user. Audible shall defined to be in compliance with ISO 7779 (DIN EN27779:1991) Noise measurements of machines acoustics. Power Switch noise shall not be considered.		
Power Saving Operation(Method)	VESA DPMS Signaling		
Power Consumption			
	Mode	LED	Power Consumption
	On	Blue	38W (typ) 43W (max)
	Active off	Amber	<1W
	Off	Off	<1W
Recovery Time	On Mode = N/A, Active Off < 3 sec		

2.5 ELECTRICAL REQUIREMENT

Horizontal / Vertical Frequency

Horizontal Frequency	24 – 82 kHz
Vertical Refresh Rate	50 – 85 Hz
Maximum Pixel Clock	165 MHz
Sync Polarity	Independent of sync polarity

Timing Table

Item	Timing	Analog			Digital - TMDS	Remark
		Separated	Composite	SOG		
1	640 x 350 @ 70 Hz, 31.5 KHz	✓	✓	✓	✓	
2	640 x 350 @ 85 Hz, 37.9 KHz	✓	✓	✓	✓	
3	640 x 400 @ 60 Hz, 31.5 KHz	✓	✓	✓	✓	
4	640 x 400 @ 70 Hz, 31.5 KHz	✓	✓	✓	✓	
5	640 x 400 @ 85 Hz, 37.9 KHz	✓	✓	✓	✓	
6	640 x 480 @ 50 Hz, 24.7 KHz	✓	✓	✓		
7	640 x 480 @ 60 Hz, 31.5 KHz	✓	✓	✓	✓	
8	640 x 480 @ 67 Hz, 35 KHz	✓	✓	✓	✓	
9	640 x 480 @ 72 Hz, 37.9 KHz	✓	✓	✓	✓	
10	640 x 480 @ 75 Hz, 37.5 KHz	✓	✓	✓	✓	
11	640 x 480 @ 85 Hz, 43.3 KHz	✓	✓	✓	✓	
12	720 x 400 @ 70 Hz, 31.5 KHz	✓	✓	✓	✓	
13	720 x 400 @ 85 Hz, 37.9 KHz	✓	✓	✓	✓	
14	720 x 480 @ 60 Hz, 31.5 KHz	✓	✓	✓	✓	
15	720 x 576 @ 50 Hz, 31.3 KHz	✓	✓	✓	✓	
16	800 x 600 @ 56 Hz, 35.1 KHz	✓	✓	✓	✓	
17	800 x 600 @ 60 Hz, 37.9 KHz	✓	✓	✓	✓	
18	800 x 600 @ 72 Hz, 48.1 KHz	✓	✓	✓	✓	
19	800 x 600 @ 75 Hz, 46.9 KHz	✓	✓	✓	✓	
20	800 x 600 @ 85 Hz, 53.7 KHz	✓	✓	✓	✓	
21	832 x 624 @ 75 Hz, 49.7 KHz	✓	✓	✓	✓	
22	1024 x 768 @ 50 Hz, 39.6 KHz	✓	✓	✓	✓	
23	1024 x 768 @ 60 Hz, 48.4 KHz	✓	✓	✓	✓	
24	1024 x 768 @ 70 Hz, 56.5 KHz	✓	✓	✓	✓	
25	1024 x 768 @ 75 Hz, 60 KHz	✓	✓	✓	✓	
26	1024 x 768 @ 75 Hz, 60.2 KHz	✓	✓	✓	✓	
27	1024 x 768 @ 85 Hz, 68.7 KHz	✓	✓	✓	✓	
28	1152 x 864 @ 75 Hz, 67.5 KHz	✓	✓	✓	✓	
29	1152 x 870 @ 75 Hz, 68.7 KHz	✓	✓	✓	✓	
30	1280 x 720 @ 50 Hz, 37.5 KHz			✓	✓	
31	1280 x 768 @ 50 Hz, 39.6 KHz	✓	✓	✓	✓	
32	1280 x 768 @ 60 Hz, 47.4 KHz	✓	✓	✓	✓	
33	1280 x 768 @ 60 Hz, 47.8 KHz	✓	✓	✓	✓	
34	1280 x 768 @ 75 Hz, 60.3 KHz	✓	✓	✓	✓	
35	1280 x 768 @ 85 Hz, 68.6 KHz	✓	✓	✓	✓	

36	1280 x 960 @ 50 Hz, 49.4 KHz	✓	✓	✓	✓	
37	1280 x 960 @ 60 Hz, 59.7 KHz	✓	✓	✓	✓	
38	1280 x 960 @ 75 Hz, 75.2 KHz	✓	✓	✓	✓	
39	1280 x 1024 @ 50 Hz, 52.7 KHz	✓	✓	✓	✓	
40	1280 x 1024 @ 60 Hz, 64 KHz	✓	✓	✓	✓	
41	1280 x 1024 @ 70 Hz, 74.6 KHz	✓	✓	✓	✓	
42	1280 x 1024 @ 72 Hz, 76.8 KHz				✓	
43	1280 x 1024 @ 75 Hz, 80 KHz	✓	✓	✓	✓	
44	1360 x 768 @ 60 Hz, 47.7 KHz	✓	✓	✓	✓	
45	1400 x 1050 @ 50 Hz, 54.1 KHz	✓	✓	✓	✓	
46	1400 x 1050 @ 60 Hz, 64.7 KHz	✓	✓		✓	
47	1400 x 1050 @ 60 Hz, 65.3 KHz	✓	✓		✓	
48	1400 x 1050 @ 75 Hz, 82.3 KHz	✓	✓	✓	✓	
49	1440 x 900 @ 60 Hz, 55.5 KHz	✓	✓	✓	✓	
50	1440 x 900 @ 60 Hz, 59.9 KHz	✓	✓	✓	✓	
51	1440 x 900 @ 75 Hz, 75 KHz	✓	✓	✓	✓	
52	1600 x 1200 @ 60 Hz, 75 KHz	✓	✓	✓	✓	
53	1680 x 1050 @ 60 Hz, 65.3 KHz	✓	✓		✓	
54	1920 x 1080 @ 50 Hz, 28.1 KHz				✓	
55	1920 x 1080 @ 60 Hz, 33.8 KHz				✓	

*1. Tolerance $\geq \pm 2\text{KHz}$. (if the range dose not cover other timing mode)

*2. Any timing not in the list, it should display as normal or show on “OUT OF RANGE” OSD message with blanking.

*3. The image quality of 85Hz mode might be worse than 75Hz.

Primary Presets

1680x1050 @ 60Hz

User Presets

Number of User Presets (recognized timings) Available: 10 presets total in FIFO configuration

Changing Modes

- Maximum Mode Change Blank Time for image stability : 5 seconds (Max), excluding “Auto Adjust” time
- Under DOS mode (640 x 350, 720 x 400 & 640 x 400), it should recall factory setting when execute “Auto Adjust”
- The monitor needs to do “Auto Adjust” the first time a new mode is detected
(see section “0-Touch™ Function Actions”)
- While running Change Mode, Auto Adjust or Memory Recall, the image shall blank

2.6 FRONT PANEL CONTROLS AND INDICATORS

Front Panel Hardware Controls

Power Switch (Front Head)	Power Control, soft Power Switch.
Power LED (Front Head)	Green – ON Orange – Active Off Dark = Soft Power Switch OFF
Front Panel Controls (Head) [⏻] [⏸] [1] [2] [▲] [▼]	[⏻] Power [⏸] Mute [1] BUTTON 1 [2] Button 2 [▲] UP ARROW BUTTON [▼] DOWN ARROW BUTTON Note: Power Button, Button 1 and Button 2 must be one-shot logic operation. (i.e. there should be no cycling)
Reaction Time	OSD must fully appear within 0.5s after pushing Button 1

Short Cuts Function from the button(s)

[1]	Main Menu
[2]	Input toggle (Analog or Digital; refer to Appendix D)
[⏸]	Mute
[▼] or [▲]	to immediately activate Contrast menu. It should be change to Brightness OSD by push button [2]
[▼]+[▲]	recall both of Contrast and Brightness to default
[1] + [2]	toggle 720x400 and 640x400 mode when input 720x400 or 640x400 mode
[1] + [▼] + [▲] (keep pushing 3 sec)	White Balance. (Not shown on user's guide)
[1] + [▼]	Power Lock
[1] + [▲]	OSD Lock
No signal + [⏻] + [▼] + [▲]	Burning mode
Signal + [⏻] + [▼] + [▲]	Factory Mode
Remark : All the short cuts function are only available while OSD off	

Function descriptions

Main Menu Controls

The Main Menu OSD includes most of control functions.

Please refer to APPENDIX C (Main Menu OSD Table) for the detail.

OSD Lock short cuts function for the buttons

The OSD lock will be activated by pressing the front panel control buttons "(1), & (▲)" for 10 seconds. If the user then tries to access the OSD by pressing any of the buttons "1", "▼", "▲", "2" a message will appear on the screen for 3 seconds showing "OSD Locked". The OSD lock will be deactivated by pressing the front panel control buttons "(1), & (▲)" again

for 10 seconds.

Note1: When the OSD is locked will lock all functions, including “Volume” and “Mute”

Note 2: Status bar indicating OSD Lock or Unlock is in progress and when complete it will indicate “OSD Locked”

Note 3: OSD Lock should not lock Power Button and Power Lock function

Power Lock short cuts function for the buttons

The power button lock will be activated by pressing the front panel control buttons "(1), & (▼)" for 10 seconds. Locking the power button means that the user won't be able to turn off the LCD while the power button is locked. If the user presses the power button while it is locked, a message will appear on the screen for 3 seconds showing "Power Button Locked". It also means that with the power button locked, the LCD would automatically turn back "On" when power is restored after a power failure. If the power button is not in the locked mode, then power should return to it's previous state when power is restored after a power failure. The power button lock will be deactivated by pressing the front panel control buttons "(1), & (▼)" again for 10 seconds.

Note 1: Status bar indicating Power Button lock or unlock is in progress and when complete it will indicate “Power Button Locked”

Note 2: Power should only be lockable in the “On State”

Memory Recall Actions

Memory Recall action on the analog and digital mode as below

1. Recall white balance to factory setting

2. Set the factory defaults as shown in Section 4-8

3. Clean all the mode setting buffer

4. Execute Auto Image Adjust

Note: Memory Recall should have no effect for Language, Power Lock, User Color Settings or Input Priority

Input Signal Notice Actions

1. The Input Signal Notice OSD appears 3 seconds when power turns on or change input signal.

The Input Signal Notice OSD position is on the right-top side of image. And the OSD background setting shall be turn on.

Resolution Notice Actions

1. Resolution Notice OSD should show on screen after changing to non-native mode for 30 sec

2. For auto input select function, it shall meet the requirement in Appendix D.

3. The OSD should disappear after 10 sec or by pushing button [1] or [2]

Resolution Notice function should be disabled when push button [2] under Resolution Notice OSD

0-Touch™ Function Actions

1. Execute Auto Image Adjust when new mode detected, and save the settings to buffer for further use

2. It should be reset by Memory Recall function

(Should not reset by power off, power unplug and others)

OSD Auto Save

The OSD shall save new settings when it is turned off by the user or when it times out. There shall not be a separate save

AUDIO INTERFACE (SPEAKER SPECIFICATION)

Speaker specification

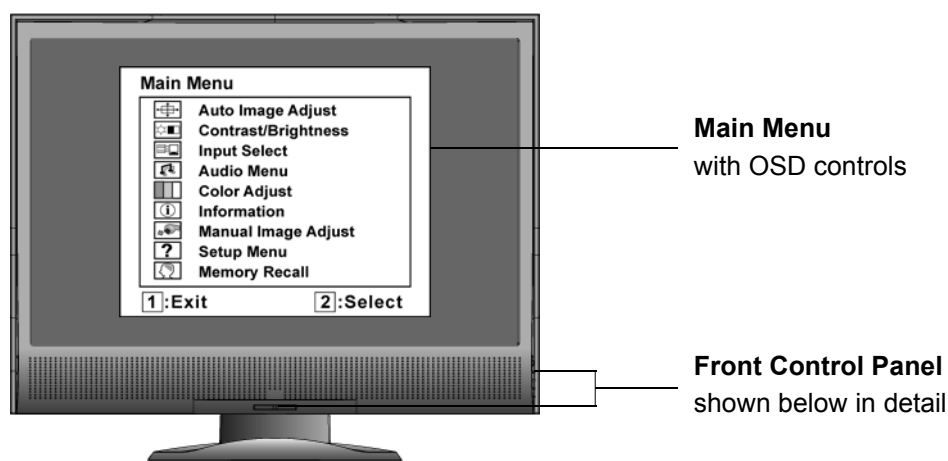
Line input connection	3.5 mm stereo jack
Line input signal	1.0 Vrms
Line input impedance	10 kOhm
Maximum power output (Electric)	2 W (RL=4Ω)
Signal to Noise Ratio	72 dB
Frequency response	100 Hz – 20 KHz
Distortion	< 10 % THD (@1kHz)
Vibration	There should be no audible vibration with volume at 100% and treble / bass at default.
Screen image	There should be no affect on the screen image stability under any conditions.
Connector PC99 requirement Audio in	Lime Green pantone # 577C
Cable type / length	3.5mm stereo cable / 1.8m length
Audio DPMS	Speakers should be off when the rest of the monitor is in power saving.

* No any sympathetic or abnormal noise allowed.

3. Front Panel Function Control Description

Adjusting the Screen Image

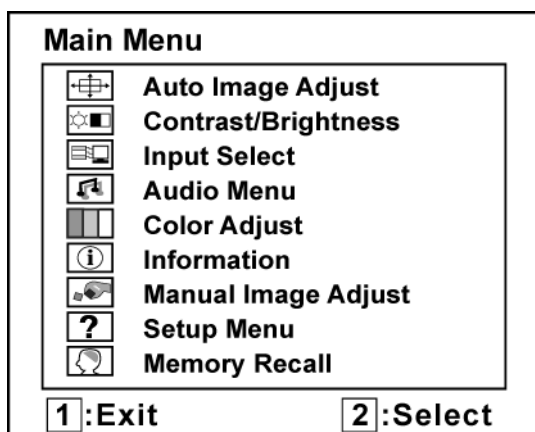
Use the buttons on the front control panel to display and adjust the OSD controls which display on the screen. The OSD controls are explained at the top of the next page and are defined in “Main Menu Controls” on page 10.



-  Standby Power On/Off
Power light
Blue = ON
Orange = Power Saving
-  Audio Mute button turns the sound off
- 1 Displays the Main Menu or exits the control screen and saves adjustments.
-   Scrolls through menu options and adjusts the displayed control.
Also a shortcut to display the Contrast adjustment control screen.
- 2 Displays the control screen for the highlighted control.
Also toggles between two controls on some screens.

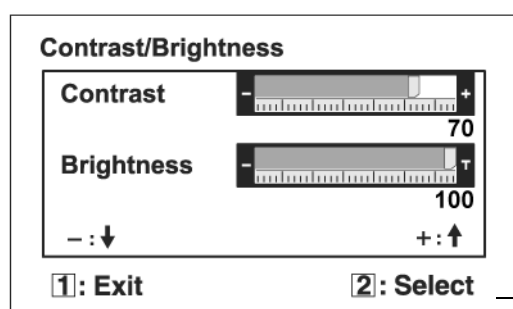
Do the following to adjust the display setting:

1. To display the Main Menu, press button [1].



NOTE: All OSD menus and adjustment screens disappear automatically after about 15 seconds. This is adjustable through the OSD timeout setting in the setup menu.

2. To select a control to adjust, press ▲ or ▼ to scroll up or down in the Main Menu.
3. After the desired control is selected, press button [2]. A control screen like the one shown below appears.



The command line at the bottom of the control screen tells what to do next from this screen. You can toggle between control screens, adjust the selected option, or exit the screen.

4. To adjust the setting, press the up ▲ or down ▼ buttons.
5. To save the adjustments and exit the menu, press button [1] *twice*.

The following tips may help you optimize your display:

- Adjust the computer's graphics card so that it outputs a 1680 x 1050 @ 60Hz video signal to the LCD display. (Look for instructions on “changing the refresh rate” in the graphics card's user guide.)
- If necessary, make small adjustments using H. POSITION and V. POSITION until the screen image is completely visible. (The black border around the edge of the screen should barely touch the illuminated “active area” of the LCD display.)

Main Menu Controls

Adjust the menu items shown below by using the up ▲ and down ▼ buttons.

Control	Explanation
	Auto Image Adjust sizes and centers the screen image automatically.
	Contrast adjusts the difference between the image background (black level) and the foreground (white level).
	Brightness adjusts background black level of the screen image.
	Input Select toggles between inputs if you have more than one computer connected to the VG2230wm.
	Audio Adjust Volume increases the volume, decreases the volume, and mutes the audio. Mute temporarily silences audio output.
	Color Adjust provides several color adjustment modes, including preset color temperatures and a User Color mode which allows independent adjustment of red (R), green (G), and blue (B). The factory setting for this product is 6500K (6500 Kelvin).

Color Adjust	
sRGB	
9300K	
7500K	
6500K	
5400K	
User Color	
1: Exit	2: Select

sRGB-This is quickly becoming the industry standard for color management, with support being included in many of the latest applications. Enabling this setting allows the LCD display to more accurately display colors the way they were originally intended. Enabling the sRGB setting will cause the Contrast and Brightness adjustments to be disabled.

9300K-Adds blue to the screen image for cooler white (used in most office settings with fluorescent lighting).

7500K - Adds blue to the screen image for cooler white (used in most office settings with fluorescent lighting).

6500K-Adds red to the screen image for warmer white and richer red.

5400K-Adds green to the screen image for a darker color.

User Color Individual adjustments for red (R), green (G), and blue (B).

1. To select color (R, G or B) press button [2].

2. To adjust selected color, press▲and▼.

Important: If you select RECALL from the Main Menu when the product is set to a Preset Timing Mode, colors return to the 6500K factory preset.



Information displays the timing mode (video signal input) coming from the graphics card in the computer, the LCD model number, the serial number, and the ViewSonic® website URL. See your graphics card's user guide for instructions on changing the resolution and refresh rate (vertical frequency).

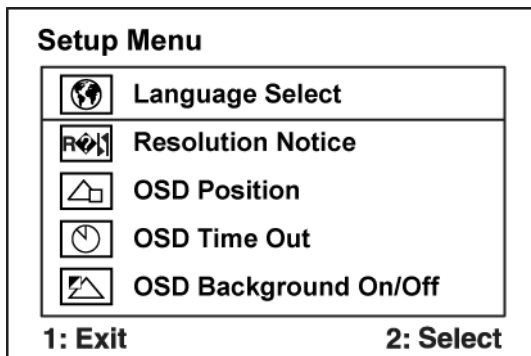
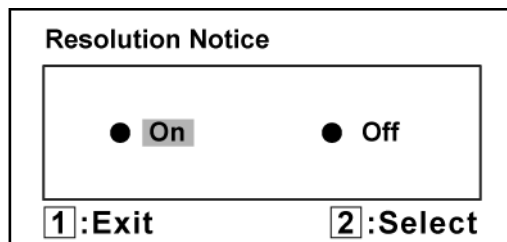
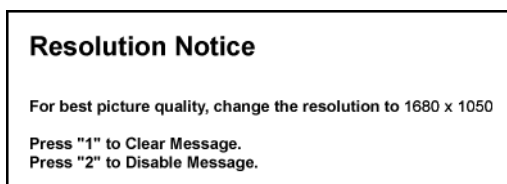
NOTE: VESA 1680 x 1050 @ 60Hz (recommended) means that the resolution is 1680 x 1050 and the refresh rate is 60 Hertz.

Information		
H. Frequency:	XX	kHz
V. Frequency:	XX	Hz
Resolution:	XXX	
Pixel Clock:	XXXXXXXXXX	MHz
Serial Number: XXXXXXXXXXXXX		
Model Number: XXXXXXXXXXXXX		
www.ViewSonic.com		1: Exit



Manual Image Adjust

Manual Image Adjust	
	Horizontal Size
	H./V. Position
	Fine Tune
	Sharpness
1: Exit 2: Select	

Control	Explanation
	Horizontal Size adjusts the width of the screen image.
	H./V. Position (Horizontal/Vertical Position) moves the screen image left or right and up or down.
	Fine Tune sharpens the focus by aligning text and/or graphics with pixel boundaries. NOTE: Try Auto Image Adjust first.
	Sharpness adjusts the clarity and focus of the screen image.
	Setup Menu displays the menu shown below: 
	Language Select allows the user to choose the language used in the menus and control screens.
	Resolution Notice allows the user to enable or disable this notice.  If you enable the Resolution Notice shown above and your computer is set at a resolution other than 1680 x 1050, the following screen appears. 

Control	Explanation
	OSD Position allows the user to move the OSD menus and control screens.
	OSD Timeout sets the length of time the OSD screen is displayed. For example, with a “30 second” setting, if a control is not pushed within 30 seconds, the display screen disappears.
	OSD Background allows the user to turn the OSD background On or Off.
	Memory Recall returns the adjustments back to factory settings if the display is operating in a factory Preset Timing Mode listed in the Specifications of this manual.

4. Circuit Description

1. RTD 2553V

Realtek RTD2553V series products are all-in-one LCD monitor controllers supporting UXGA / WSXGA+ / WXGA+ / SXGA (optional), and integrate Realtek high performance ADC, TMDS Rx(optional), scaling engine, OSD engine, LVDS Tx, RSDS Tx and so on. Moreover, all products are pin compatible in QFP128-pin package to save cost and make the design easier.

2. RTD2120

This chip is the micro-processor of LCD monitor. It uses the design ware DW8051 of Synopsys as the 8051 core of this chip and is compatible with other industry 8051 series. Also, 96Kbyte FLASH with 8 bit bus is embedded in this chip which is licensed from TSMC 0.18um e-FLASH process. Here we use the package of PLCC44/LQFP48 if we would like to have a discrete MCU controller or we make a multi-chip package with our LCD monitor controller to form one chip package to save the cost of package and PCB material.

EDID

Supplier should update the ID code (byte 10-11), Manufacture Date (byte 16-17) and Serial Number (byte 72-89).

Analog EDID

Time: 15:53:11
Date: Tue Jul 11, 2006

VIEWSONIC CORPORATION
EDID Version # 1, Revision # 3
DDCTest For: ViewSonic VG2230wm

EDID Block 0, Bytes 0-127
128 BYTES OF EDID CODE:

	0	1	2	3	4	5	6	7	8	9
0		00	FF	FF	FF	FF	FF	FF	00	5A 63
10		1E	A2	01	01	01	01	10	01	03
20		0E	2F	1E	78	2E	D0	05	A3	55 49
30		9A	27	13	50	54	BF	EF	80	B3 00
40		A9	40	95	00	90	40	81	80	81 40
50		71	4F	01	01	21	39	90	30	62 1A
60		27	40	68	B0	36	00	DA	28	11 00
70		00	1C	00	00	00	FF	00	51	43 39
80		30	36	30	31	30	30	30	30	31 0A
90		00	00	00	FD	00	32	4B	1E	52 11
100		00	0A	20	20	20	20	20	20	00 00
110		00	FC	00	56	47	32	32	33	30 77
120		6D	0A	20	20	20	20	00	93	

-
- (08-09) ID Manufacturer Name _____ = VSC
- (11-10) Product ID Code _____ = A21E
- (12-15) Last 5 Digits of Serial Number _____ = Not Used
- (16) Week of Manufacture _____ = 01
- (17) Year of Manufacture _____ = 2006
- (10-17) Complete Serial Number _____ = See Descriptor Block
- (18) EDID Version Number _____ = 1
- (19) EDID Revision Number _____ = 3
- (20) VIDEO INPUT DEFINITION:
- Analog Signal
- 0.700, 0.300 (1.000 Vp-p)
- Separate Syncs, Composite Sync, Sync on Green
- (21) Maximum Horizontal Image Size _____ = 470 mm
- (22) Maximum Vertical Image Size _____ = 300 mm
- (23) Display Gamma _____ = 2.20
- (24) Power Management and Supported Feature(s):
- Active Off/Very Low Power, Standard Default Color Space,
- Preferred Timing Mode
- Display Type = R/G/B Color
- (25-34) CHROMA INFO:
- Red X - 0.640 Green X - 0.285 Blue X - 0.152 White X - 0.313
- Red Y - 0.333 Green Y - 0.602 Blue Y - 0.074 White Y - 0.329
- (35) ESTABLISHED TIMING I:
- 720 X 400 @ 70Hz (IBM,VGA)
- 640 X 480 @ 60Hz (IBM,VGA)
- 640 X 480 @ 67Hz (Apple,Mac II)
- 640 X 480 @ 72Hz (VESA)
- 640 X 480 @ 75Hz (VESA)
- 800 X 600 @ 56Hz (VESA)
- 800 X 600 @ 60Hz (VESA)
- (36) ESTABLISHED TIMING II:
- 800 X 600 @ 72Hz (VESA)
- 800 X 600 @ 75Hz (VESA)
- 832 X 624 @ 75Hz (Apple,Mac II)
- 1024 X 768 @ 60Hz (VESA)
- 1024 X 768 @ 70Hz (VESA)
- 1024 X 768 @ 75Hz (VESA)
- 1280 X 1024 @ 75Hz (VESA)
- (37) Manufacturer's Reserved Timing:
- 1152 X 870 @ 75Hz (Apple,Mac II)
- (38-53) Standard Timing Identification:

1680 X 1050 @60Hz
1600 X 1200 @60Hz
1440 X 900 @60Hz
1400 X 1050 @60Hz
1280 X 1024 @60Hz
1280 X 960 @60Hz
1152 X 864 @75Hz
Not Used

(54-71) Detailed Timing / Descriptor Block 1:

1680x1050 Pixel Clock: 146.25 MHz

Horizontal Image Size: 474 mm	Vertical Image Size: 296 mm
Refreshed Mode: Non-Interlaced	Normal Display - No Stereo

Horizontal:

Active Time: 1680 pixels	Blanking Time: 560 pixels
Sync Offset: 104 pixels	Sync Pulse Width: 176 pixels
Border: 0 pixels	Frequency: 65.29 KHz

Vertical:

Active Time: 1050 lines	Blanking Time: 39 lines
Sync Offset: 3 lines	Sync Pulse Width: 6 lines
Border: 0 lines	Frequency: 59.95 Hz

Digital Separate, Horizontal Polarity (-) Vertical Polarity (+)

(72-89) Detailed Timing / Descriptor Block 2:

Monitor Serial Number:
QC9060100001

(90-107) Detailed Timing / Descriptor Block 3:

Monitor Range Limits:
Min Vertical Freq - 50 Hz
Max Vertical Freq - 75 Hz
Min Horiz. Freq - 30 KHz

Max Horiz. Freq - 82 KHz
Pixel Clock - 170 MHz
Secondary GTF - Not Supported

(108-125) Detailed Timing / Descriptor Block 4:

Monitor Name:
VG2230wm

- (126) No Extension EDID Block(s)
- (127) CheckSum OK

Digital EDID

Time: 15:53:51
Date: Tue Jul 11, 2006

VIEWSONIC CORPORATION
EDID Version # 1, Revision # 3
DDCTest For: ViewSonic VG2230wm

EDID Block 0, Bytes 0-127

128 BYTES OF EDID CODE:

	0	1	2	3	4	5	6	7	8	9
0		00	FF	FF	FF	FF	FF	FF	00	5A 63
10		1E	A2	01	01	01	01	10	01	03
20		80	2F	1E	78	2E	D0	05	A3	55 49
30		9A	27	13	50	54	BF	EF	80	B3 00
40		A9	40	95	00	90	40	81	80	81 40
50		71	4F	31	0A	21	39	90	30	62 1A
60		27	40	68	B0	36	00	DA	28	11 00
70		00	1C	00	00	00	FF	00	51	43 39
80		30	36	30	31	30	30	30	30	31 0A
90		00	00	00	FD	00	32	4B	1E	52 11
100		00	0A	20	20	20	20	20	00	00
110		00	FC	00	56	47	32	32	33	30 77
120		6D	0A	20	20	20	00	E8		

(08-09) ID Manufacturer Name _____ = VSC
(11-10) Product ID Code _____ = A21E
(12-15) Last 5 Digits of Serial Number _____ = Not Used
(16) Week of Manufacture _____ = 01
(17) Year of Manufacture _____ = 2006
(10-17) Complete Serial Number _____ = See Descriptor Block
(18) EDID Version Number _____ = 1
(19) EDID Revision Number _____ = 3
(20) VIDEO INPUT DEFINITION:
Digital Signal
Non - VESA DFP 1.x Compatible

(21) Maximum Horizontal Image Size _____ = 470 mm
(22) Maximum Vertical Image Size _____ = 300 mm
(23) Display Gamma _____ = 2.20
(24) Power Management and Supported Feature(s):

Active Off/Very Low Power, Standard Default Color Space,

Preferred Timing Mode

Display Type = R/G/B Color

(25-34) CHROMA INFO:

Red X - 0.640 Green X - 0.285 Blue X - 0.152 White X - 0.313

Red Y - 0.333 Green Y - 0.602 Blue Y - 0.074 White Y - 0.329

(35) ESTABLISHED TIMING I:

720 X 400 @ 70Hz (IBM,VGA)

640 X 480 @ 60Hz (IBM,VGA)

640 X 480 @ 67Hz (Apple,Mac II)

640 X 480 @ 72Hz (VESA)

640 X 480 @ 75Hz (VESA)

800 X 600 @ 56Hz (VESA)

800 X 600 @ 60Hz (VESA)

(36) ESTABLISHED TIMING II:

800 X 600 @ 72Hz (VESA)

800 X 600 @ 75Hz (VESA)

832 X 624 @ 75Hz (Apple,Mac II)

1024 X 768 @ 60Hz (VESA)

1024 X 768 @ 70Hz (VESA)

1024 X 768 @ 75Hz (VESA)

1280 X 1024 @ 75Hz (VESA)

(37) Manufacturer's Reserved Timing:

1152 X 870 @ 75Hz (Apple,Mac II)

(38-53) Standard Timing Identification:

1680 X 1050 @60Hz

1600 X 1200 @60Hz

1440 X 900 @60Hz

1400 X 1050 @60Hz

1280 X 1024 @60Hz

1280 X 960 @60Hz

1152 X 864 @75Hz

640 X 400 @70Hz

(54-71) Detailed Timing / Descriptor Block 1:

1680x1050 Pixel Clock: 146.25 MHz

Horizontal Image Size: 474 mm

Vertical Image Size: 296 mm

Refreshed Mode: Non-Interlaced

Normal Display - No Stereo

Horizontal:

Active Time: 1680 pixels

Blanking Time: 560 pixels

Sync Offset: 104 pixels

Sync Pulse Width: 176 pixels

Border: 0 pixels

Frequency: 65.29 KHz

Vertical:

Active Time: 1050 lines

Blanking Time: 39 lines

Sync Offset: 3 lines

Sync Pulse Width: 6 lines

Border: 0 lines

Frequency: 59.95 Hz

Digital Separate, Horizontal Polarity (-) Vertical Polarity (+)

(72-89) Detailed Timing / Descriptor Block 2:

Monitor Serial Number:

QC9060100001

(90-107) Detailed Timing / Descriptor Block 3:

Monitor Range Limits:

Min Vertical Freq - 50 Hz

Max Vertical Freq - 75 Hz

Min Horiz. Freq - 30 KHz

Max Horiz. Freq - 82 KHz

Pixel Clock - 170 MHz

Secondary GTF - Not Supported

(108-125) Detailed Timing / Descriptor Block 4:

Monitor Name:

VG2230wm

(126) No Extension EDID Block(s)

(127) CheckSum OK

5. Adjustment Procedure

A. Function Test and Alignment Procedure

1. All Modes Reset

You should do “All Model Reset” (Refer to Chap 3. Hot Keys for Function Controls) first. This action will allow you to erase all end-user’s settings and restore the factory defaults.

2. Auto Image Adjust

The Auto Adjust is aimed to offer a best screen quality by built-in ASIC. For optimum screen quality, the user has to adjust each function manually.

A. Turn the computer and LCD monitor on.

B. Press the ‘Auto’ button on monitor keypad to Auto Adjust.

C. The LCD monitor will start the Auto Adjust process automatically and run for 10 consecutive seconds, during which time you will notice the image change.

3. Firmware

Test Pattern: Burn in Model (Refer to Chap3. Hot Keys for Function Control)

-Make sure the F/W is the latest version.

4. DCC

Test Pattern: EDID program

-Make sure it can pass test program.

5. Window Shut Down

Test Signal: 1280*1024@60Hz

Test Pattern:



Checkered Pattern Every One Pixel (50%Green & 50%Blue)

Inspection Item: Flicker, Mura

6. Window BG

Test Signal: 1280*1024@60Hz

Test Pattern:



Window standard pattern

Inspection Item: Line Defect, Function Defect & Mura

7. 25 Gray

Test Signal: 1280*1024@60Hz

Test Pattern:



Full Screen 25% White (Gray)

Inspection Item: Particle, Line Defect & Mura

8. 50 Gray

Test Signal: 1280*1024@60Hz

Test Pattern:



Full Screen 50% White (Gray)

Inspection Item: Bright Dot, Particle, Line Defect & Mura

9. White Box

Test Signal: 1280*1024@60Hz

Test Pattern:



Window standard pattern

Inspection Item: Particle, Line Defect, Power, Image Remain & Mura

10. Black Box

Test Signal: 1280*1024@60Hz

Test Pattern:



Window standard pattern

Inspection Item: Bright Dot, Line Defect & Power

11. RED

Test Signal: 1280*1024@60Hz

Test Pattern:



Full Screen Red

Inspection Item: Bright Dot, Partial & Line Defect

12. Green

Test Signal: 1280*1024@60Hz

Test Pattern:



Full Screen Green

Inspection Item: Bright Dot, Partial & Line Defect

13. Blue

Test Signal: 1280*1024@60Hz

Test Pattern:



Full Screen Blue

Inspection Item: Bright Dot, Partial & Line Defect

14. Gray_Scale_0-100_V64

Test Signal: 1280*1024@60Hz

Test Pattern:



Vertical 64 (256) Gray Scale (Right → Left , From 0 to 100% White)

Inspection Item: Line Defect & Function Defect

15. Function Test Display pattern

Item	Pattern	Description	Remark
1	Gray_Scale_0-100_V	Vertical 64 (256) Gray Scale (右→左 , From 0 to 100% White)	Figure 1
2	Gray_Scale_0-100_H	Horizontal 64 (256) Gray Scale (上→下 , From 0 to 100% White)	Figure 2
3	Black	Full Screen Black	Figure 3
4	Red	Full Screen 50% Red	Figure 4
5	Green	Full Screen 50% Green	Figure 5
6	Blue	Full Screen 50% Blue	Figure 6
7	White	Full Screen White	Figure 7
8	Black_Tile	Black Tile Under White Background	Figure 8

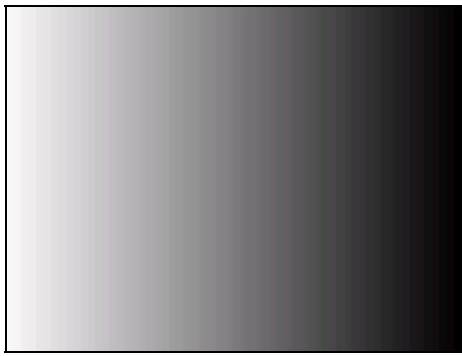


Figure 1

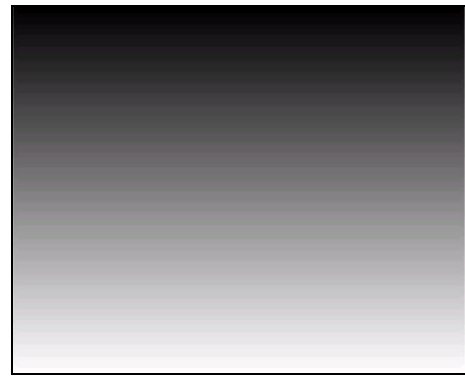


Figure 2

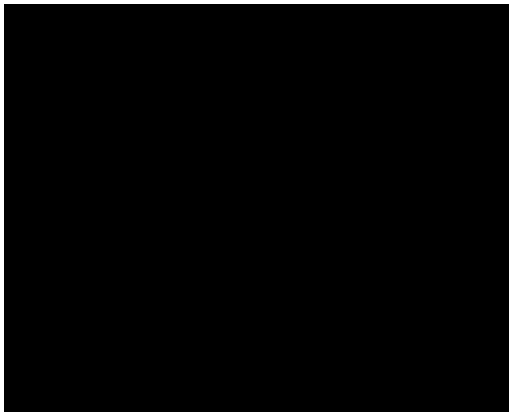


Figure 3



Figure 4



Figure 5



Figure 6

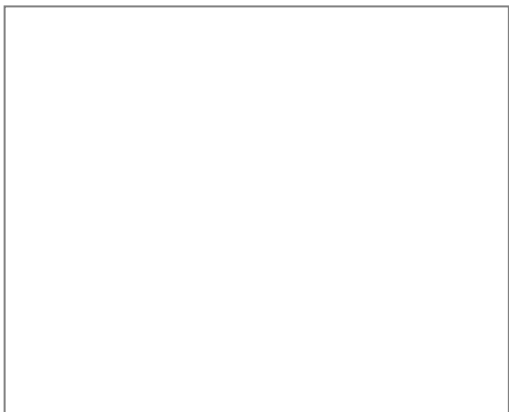


Figure 7

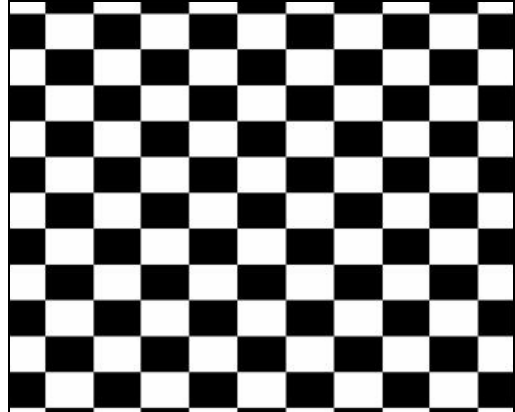


Figure 8

BIOS Update User Guide

1. To setup ISP environment

Hardware:

PC or Notebook , Parallel(Printer) cable , ISP tool(Fig 1)

Software:

ISP driver .

If the O.S. was Win2000 or Win XP please have to install

PORT95NT.exe



Fig1

In order to ensure can execute ISP program, please set BIOS in PC or Notebook as Fig 2

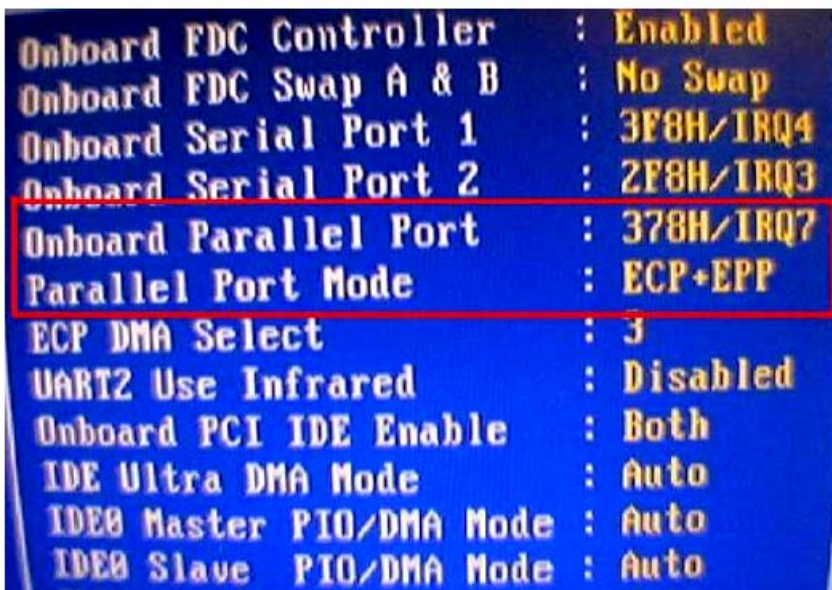


Fig 2

2. Install ISP

2.1 User could download ISP driver and PORT95NT install file from Myson Centurywebsite([//www.myson.com.tw](http://www.myson.com.tw))

2.2 After extracting the zip file, the total files list as Fig 2.2, and double click the file of setup.exe to install.

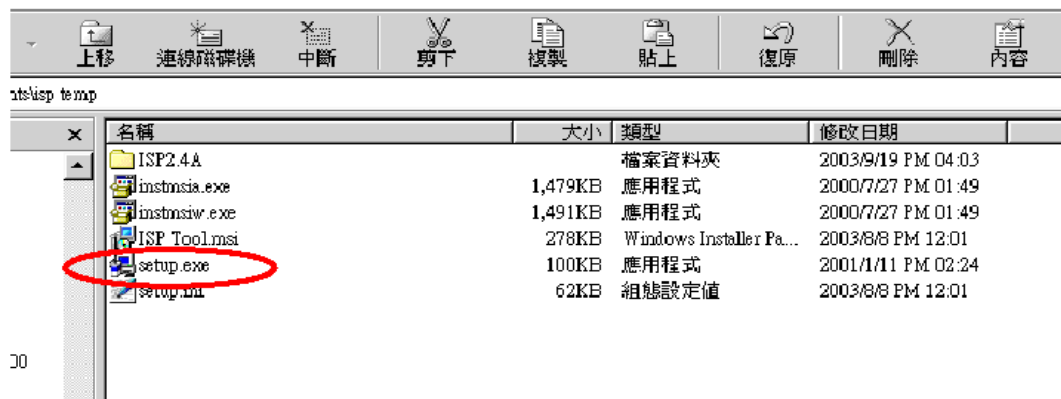


Fig 2.2

2.3 Press “Next” button to continue., see Fig 2.3

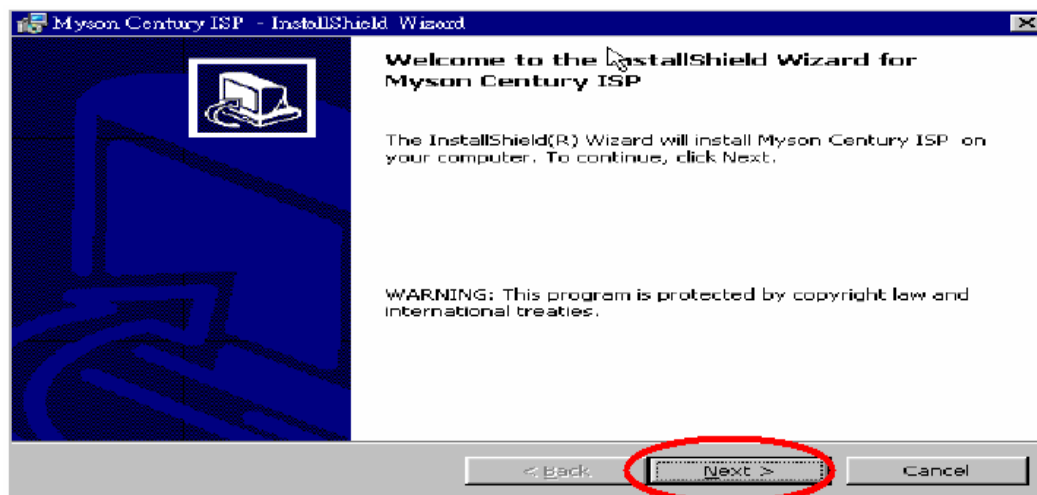


Fig 2.3

2.4 Keep default setting or press “Change” button for selecting the path that you want , and then press “Next” button to continue, see Fig 2.4.

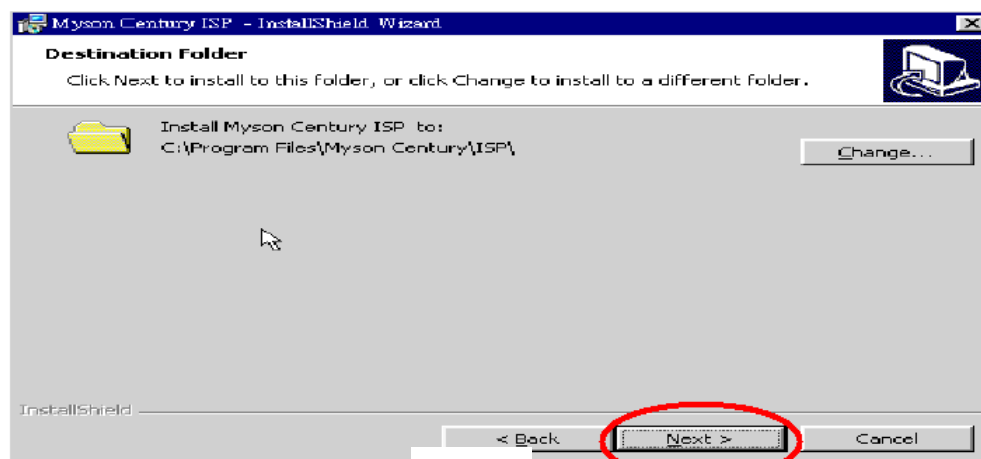


Fig 2.4

2.5 Press “Install” button to continue, see Fig 2.5

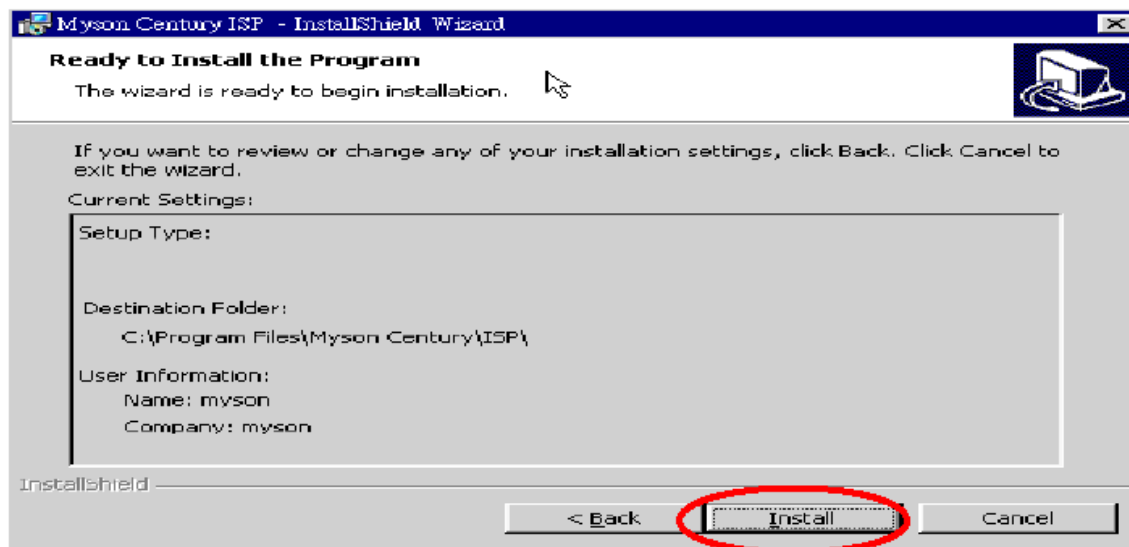


Fig 2.5

2.6 The Installer Information shows package warning, press “Ignore” button to continue, see Fig 2.6.

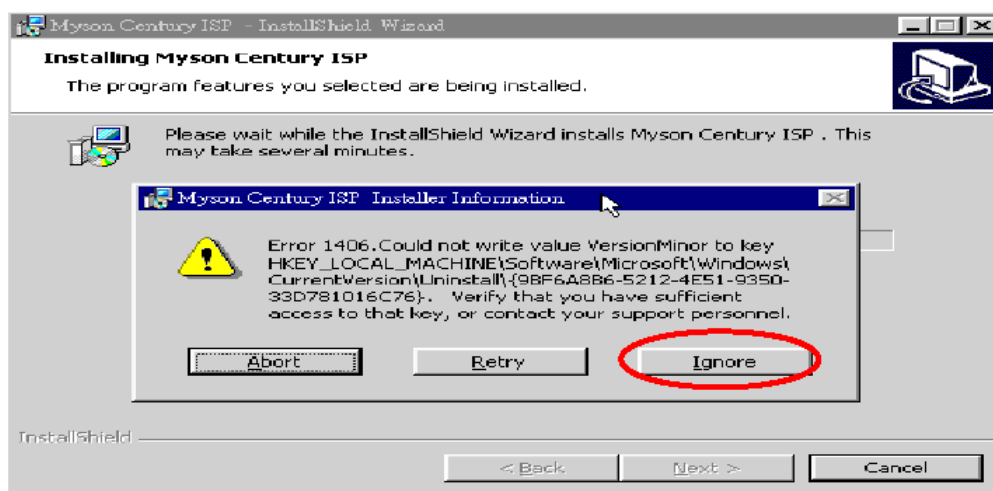


Fig 2.6

2.7 Installation has finished, press “Finish” button, see Fig 2.7.

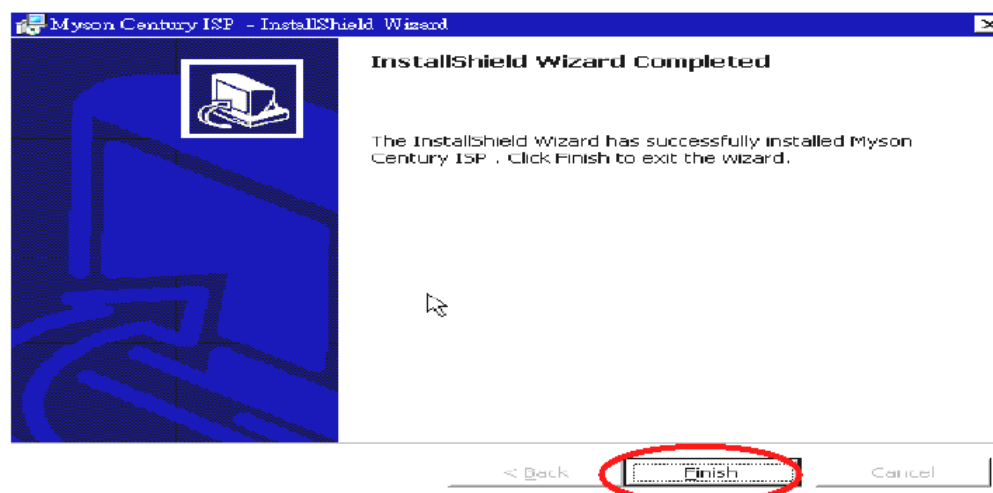


Fig 2.7

3. ISP security code

3.1 After installation, we could find the shortcut in the setting path or the program bar (default setting), see Fig 3.1.

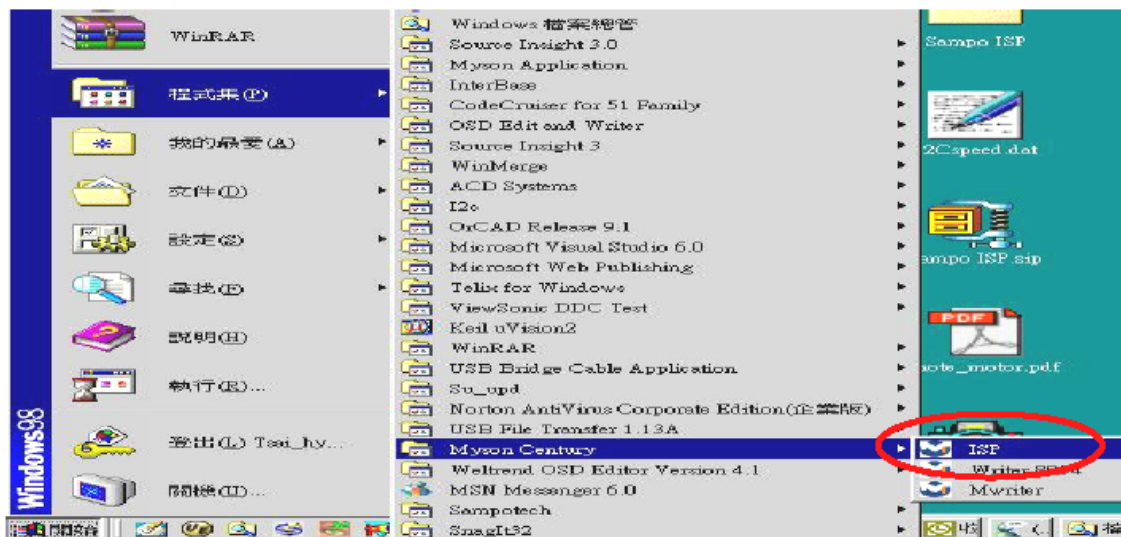


Fig 3.1

2.2 Security file is a key to use ISP function, press “確定” button, see Fig 3.2.

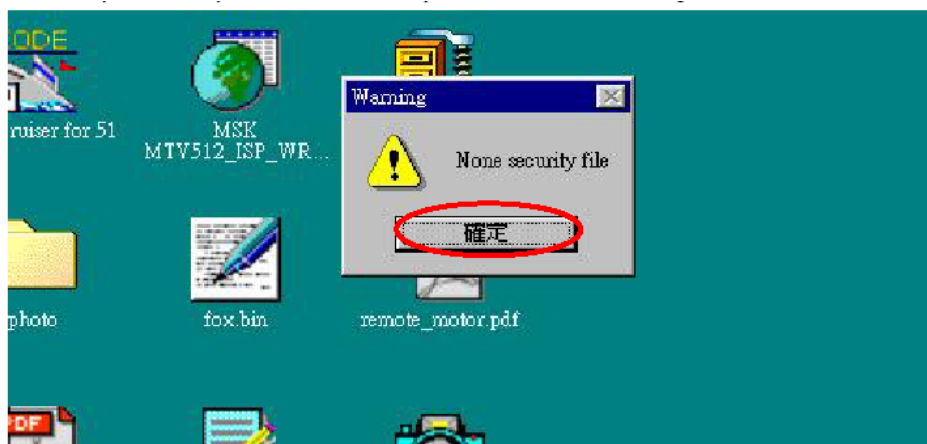


Fig 3.2

3.3 The warning is used to remind user of that different CPU rate may cause ISP function fail(it is limited by IIC protocol), press “確定” button, see Fig 3.3.



Fig 3.3

2.4 Press “Create Security File” button to key in **security code**. Adjusting bar to decrease **speed of IIC bus**, see Fig 3.4.

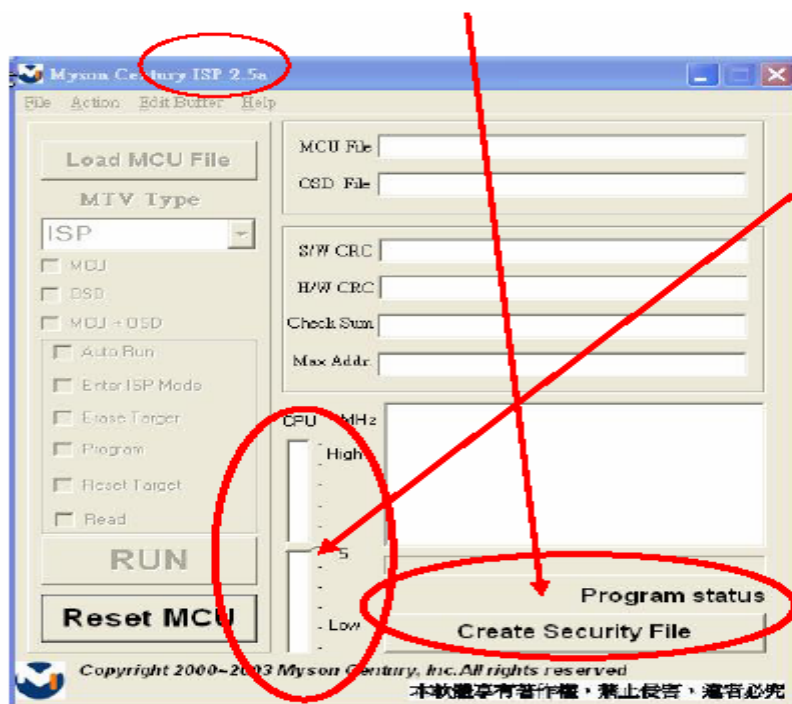


Fig 3.4

3.5 At least **2** Command No of security code, see Fig 3.5, and different security code between hardware ISP and software ISP. The security code of software ISP is set by user while coding, but the security code of hardware ISP is set by Myson Century.

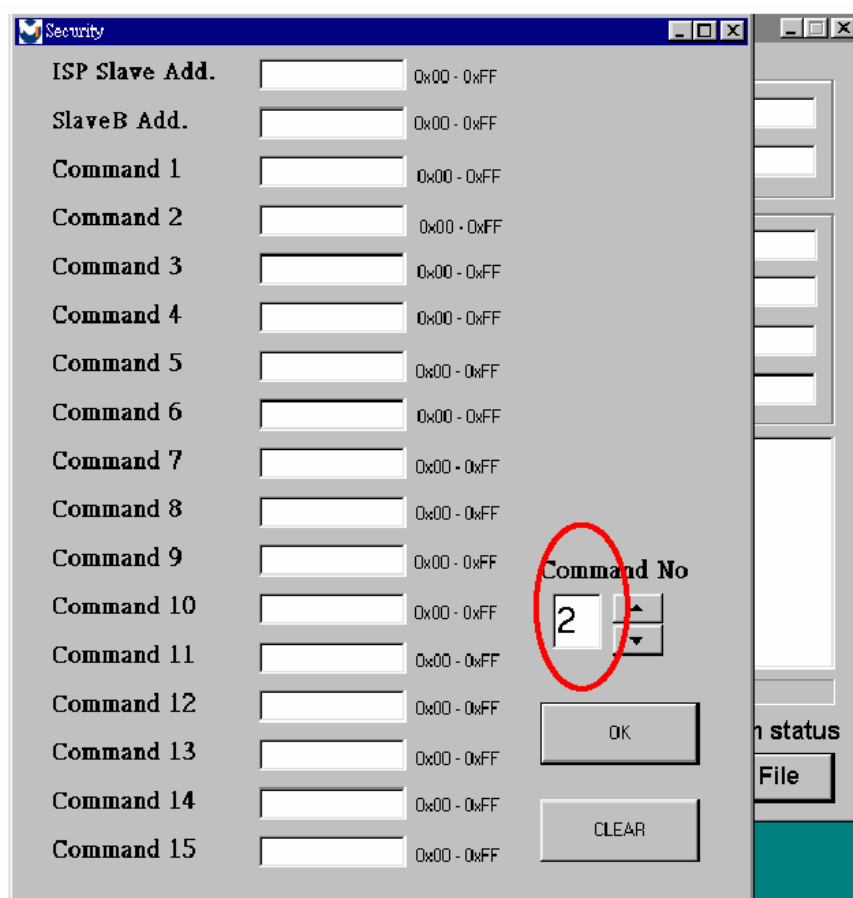


Fig 3.5

3.6 Fig 3.6 shows the setting for security code of **hardware ISP**, it needs **4** Command No, and key in command sequentially for **94, 94, AC, CA, 53**.

Field	Value	Range
ISP Slave Add.	94	0x00 - 0xFF
SlaveB Add.	94	0x00 - 0xFF
Command 1	ac	0x00 - 0xFF
Command 2	ca	0x00 - 0xFF
Command 3	53	0x00 - 0xFF
Command 4		0x00 - 0xFF
Command 5		0x00 - 0xFF
Command 6		0x00 - 0xFF
Command 7		0x00 - 0xFF
Command 8		0x00 - 0xFF
Command 9		0x00 - 0xFF
Command 10		0x00 - 0xFF
Command 11		0x00 - 0xFF
Command 12		0x00 - 0xFF
Command 13		0x00 - 0xFF
Command 14		0x00 - 0xFF
Command 15		0x00 - 0xFF

Command No: 4

OK CLEAR

Fig 3.6

3.7 Fig 3.7 shows the setting for security code of **software ISP**, it needs **2** Command No, and key in command sequentially for **7C, 4C, 77**. The Command No and command must be set by user while coding. About the detail of setting, please refer to Section 6 Boot code of ISP.

The screenshot shows a 'Security' dialog box with the following fields and values:

Field	Value	Range
ISP Slave Add.	7C	0x00 - 0xFF
SlaveB Add.	4C	0x00 - 0xFF
Command 1	77	0x00 - 0xFF
Command 2		0x00 - 0xFF
Command 3		0x00 - 0xFF
Command 4		0x00 - 0xFF
Command 5		0x00 - 0xFF
Command 6		0x00 - 0xFF
Command 7		0x00 - 0xFF
Command 8		0x00 - 0xFF
Command 9		0x00 - 0xFF
Command 10		0x00 - 0xFF
Command 11		0x00 - 0xFF
Command 12		0x00 - 0xFF
Command 13		0x00 - 0xFF
Command 14		0x00 - 0xFF
Command 15		0x00 - 0xFF

Below the command fields, there is a 'Command No' field with a value of 2, and buttons for 'OK' and 'CLEAR'. The 'Command No' field and its value are circled in red.

Fig 3.7

4. Use ISP to program MCU

- 4.1 Select MTV type first, load the binary or Intel hex file that you want to program into the MCU, and select “Auto” item, then press “RUN” button, see Fig 4.1.
- 4.2 If user changes the MTV type, it must load file again, or the buffer of load file will be cleared.
- 4.3 CRC (cyclic redundancy check): the host can check CRC register’ s result instead of reading every byte in flash. The message of Check MCU CRC OK means that the Host verify ok for the progress of program.

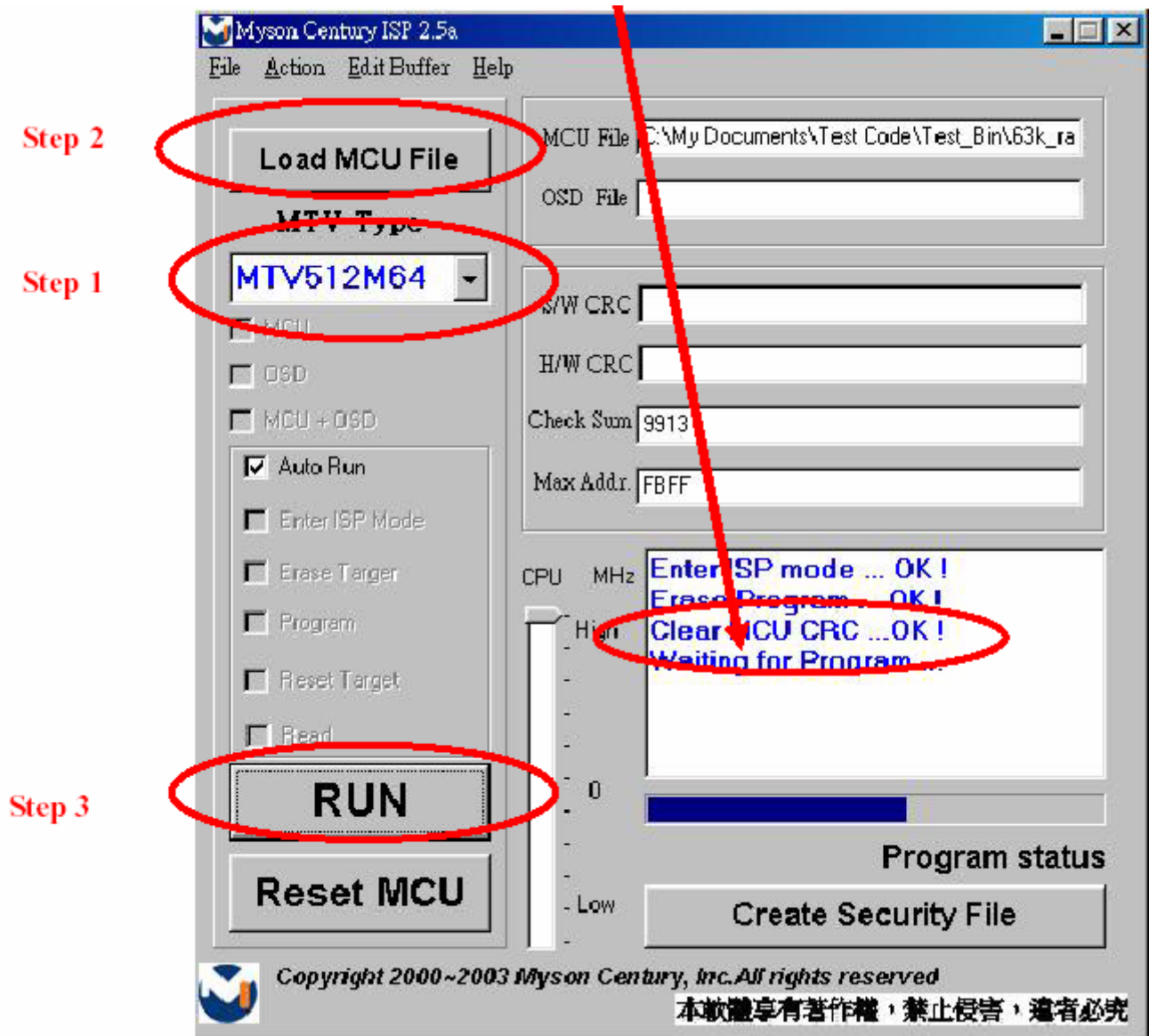


Fig 4.1

5 Use ISP to read MCU content

5.1 Only software ISP could read the MCU content, it is according to program the boot code while coding. The limitation is used for the security of customer' s code. Select “Read Target” item, and press “RUN” button, the MCU content will show as Fig 5.1.

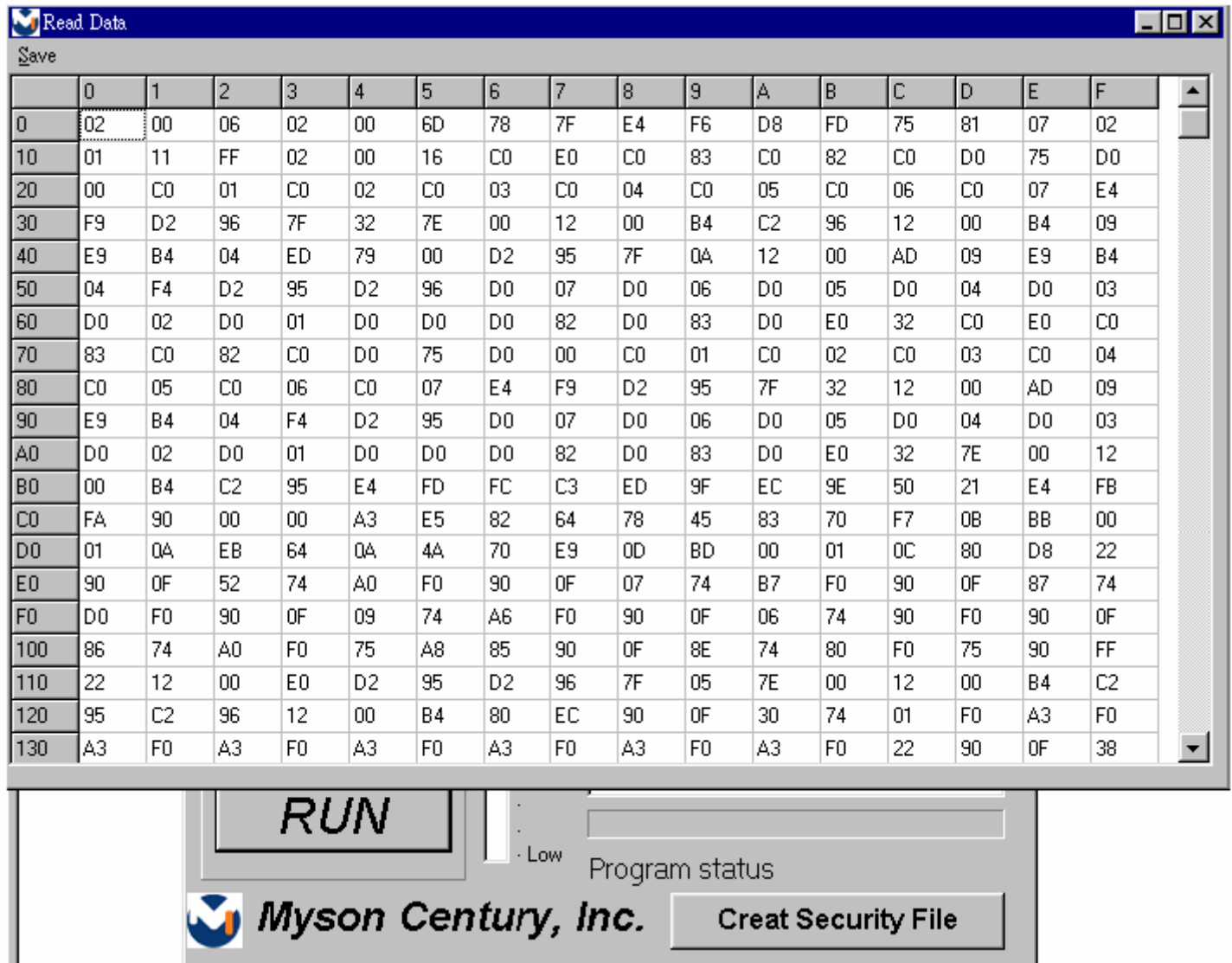


Fig 5.1

5.2 If user uses hardware ISP to read MCU content, it shows as Fig 5.2.

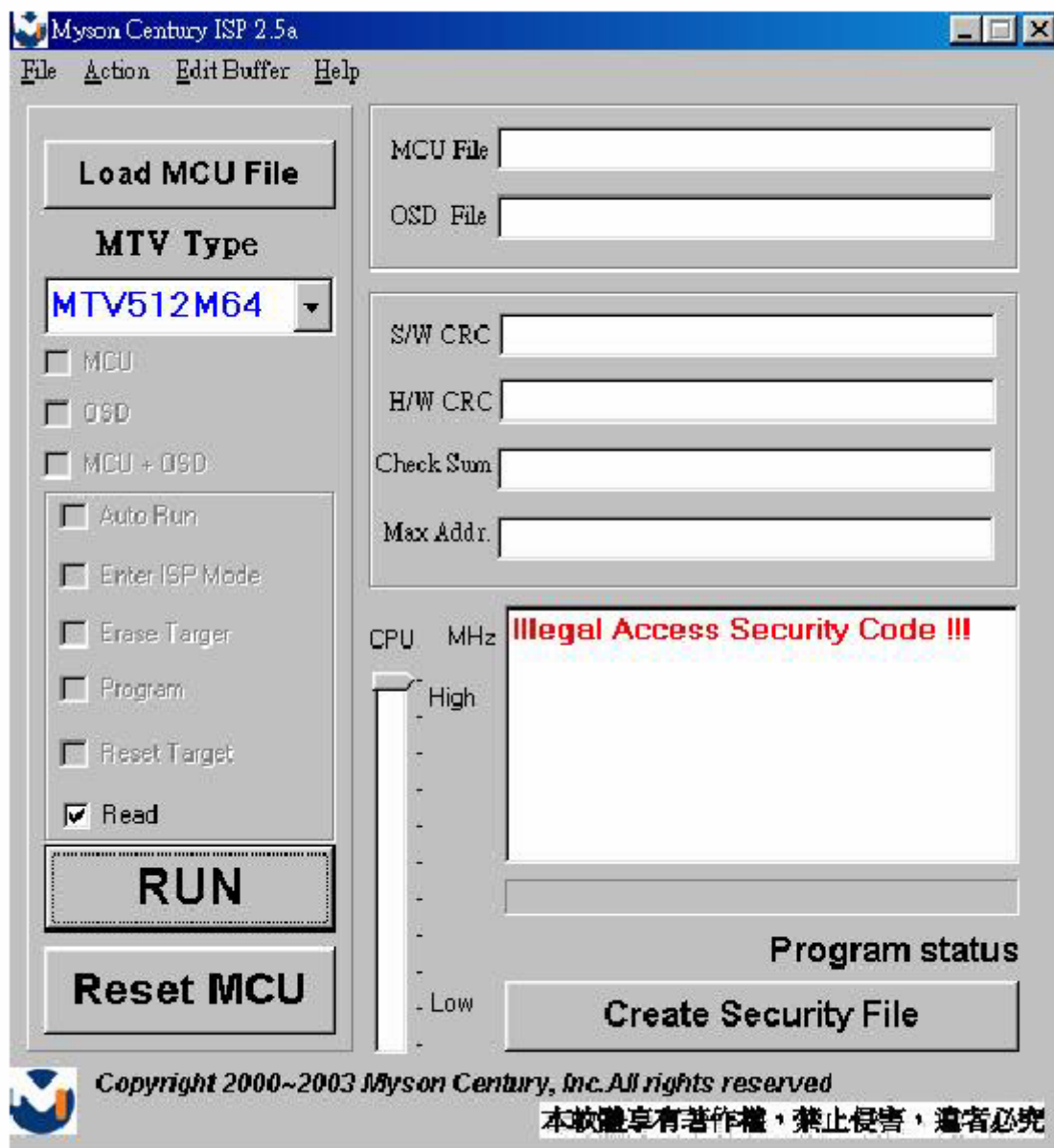
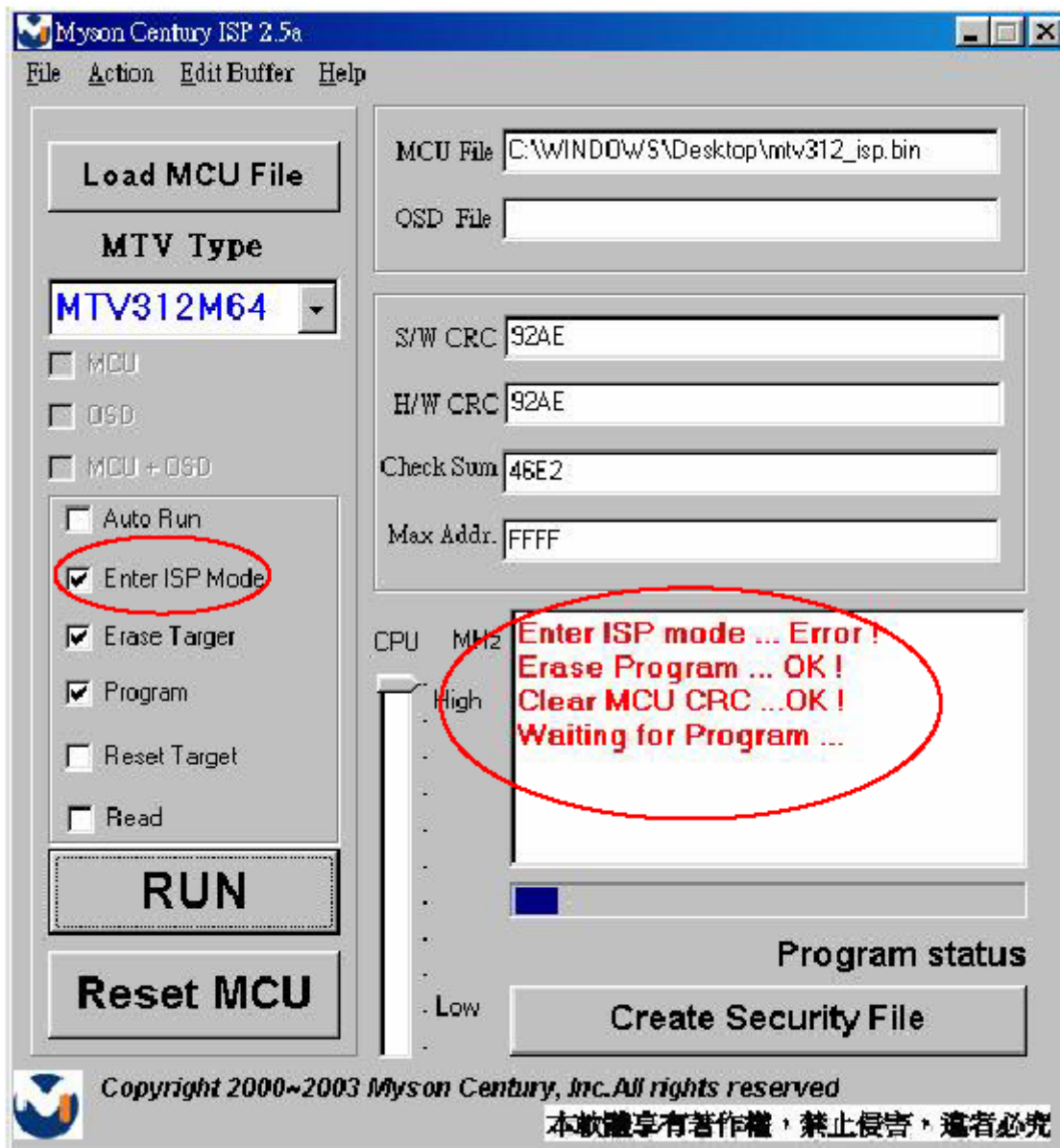
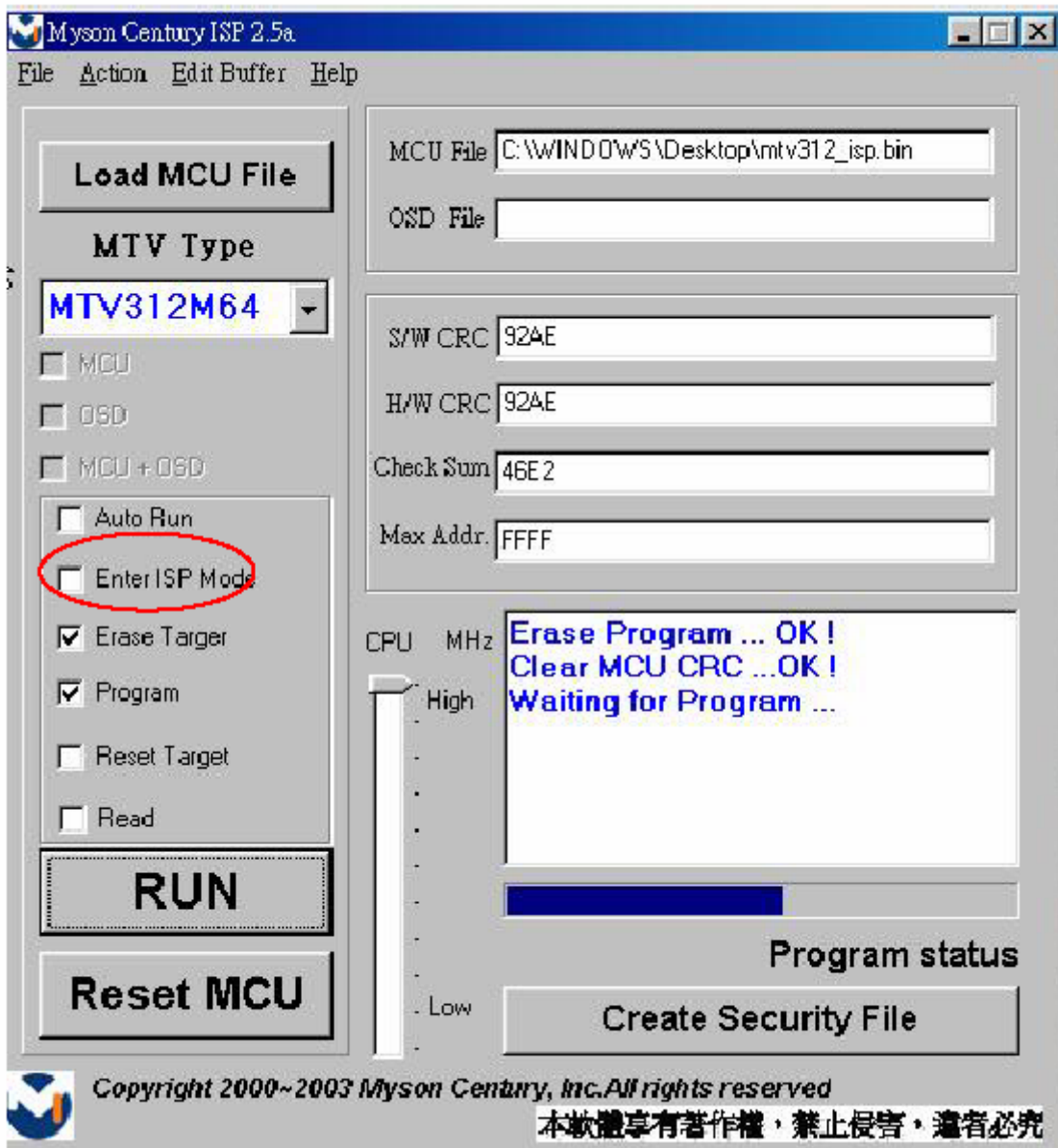


Fig 5.2

6 Re-entry the ISP Mode

When you could not select or click 'Reset MCU' button and enter ISP mode again, you refer the message as below:





Note:

- (1) Disable the 'Enter ISP Mode' option to avoid the error message display.
- (2) If you are using the MTV312M64 or before MCU serials, the MCU will always be in 'ISP Mode' even if programming fails or erases the MCU. Instead of selecting or pressing 'Reset MCU'.

7. Boot code of ISP

7.1 Hardware ISP

- (1) Without boot code
- (2) Fixed security code: 94, 94, AC, CA, 53
- (3) Attention to the pin of HSCL (1) and HSDA (1) should keep in enable
- (4) MTV412M, MTV512M, CS8954 support hardware ISP

7.2 Software ISP

- (1) With boot code
- (2) User define the security code
- (3) Attention to the pin of HSCL (1) and HSDA (1) should keep in enable
- (4) Only software ISP could read the MCU content
- (5) MTV212M, MTV312M, MTV230M, MTV412M, MTV512M, CS8954 support software ISP

7.3 Boot code of software ISP

- (1) Initialize MCU
 - (a) Define the I/O pin to HSCL (1) and HSDA (1)
 - (b) Define the slave B address
 - (c) Enable 8051 INT1 (ISR 2)
- (2) Coding for INT1 while get into ISP mode
 - (a) Clear watchdog to prevent reset during ISP period
 - (b) Disable all interrupt to prevent CPU wake-up
 - (c) Write ISP slave address
 - (d) Write 93h to ISP enable address to enable ISP
 - (e) Enter 8051 idle mode

7.4 The followings show the relationship between the code and the security code.

```

//
XRAM[SLV0ADDR]=0x80|(0x4c>>1);
// Set P3.0, P3.1, P3.4, p3.5 to IIC related pins
XRAM[PADMOD0]=0xc0;
XRAM[PADMOD1]=0xff;
XRAM[PADMOD2]=0xf7;
XRAM[PADMOD3]=0xff; // Use HSCL, HSDA, ISCL, ISDA
XRAM[HVSTUS]=0xe0; // enable composite
XRAM[HV_INTEN]=0x01;

TH0=0x0fc;
TLO=0x18;
IT1=0;
TMOD=0x51;
TRO=1;
//IE=0x86;
IE = 0x84; //enable INT1
P1=0x0ff; // Set a:
}

```

```

if( ( INTFLG&0x20 ) !=0 )
{
XRAM[IIC_INTFLG]=INTFLG&0x08;
}
if( ( INTFLG&0x40 ) !=0 )
{
if( (XRAM[IIC_STUS1]&0x80 ) !=0)
{
temp=XRAM[TXRCBBUF];
if( temp == 0x77)
{
//test=1;
IE=0;
XRAM[WDT]=0;
XRAM[ISPSLV]=0x7c;
XRAM[ISPEN]=0x93;
PCON=1;
}
}
}

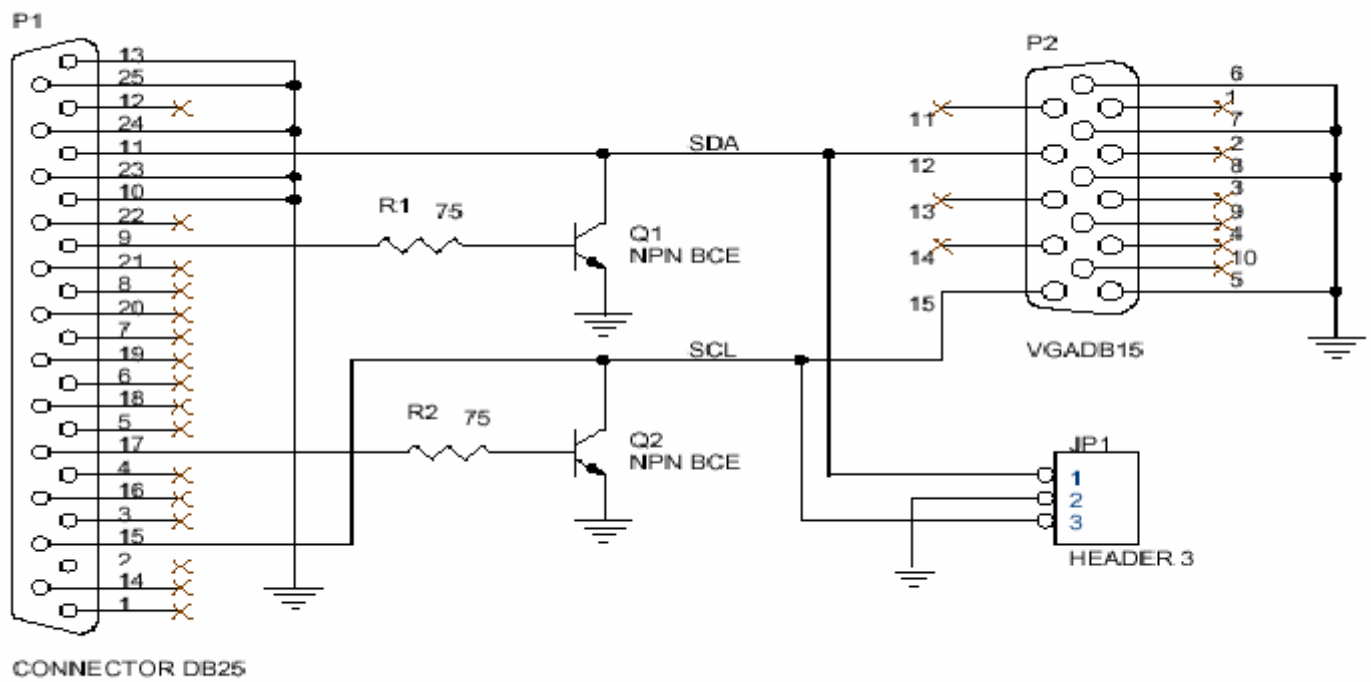
```

Security		
ISP Slave Add.	7c	0x00 - 0xFF
SlaveB Add.	4c	0x00 - 0xFF
Command 1	7d	0x00 - 0xFF
Command 2		0x00 - 0xFF
Command 3		0x00 - 0xFF
Command 4		0x00 - 0xFF
Command 5		0x00 - 0xFF
Command 6		0x00 - 0xFF
Command 7		0x00 - 0xFF
Command 8		0x00 - 0xFF
Command 9		0x00 - 0xFF
Command 10		0x00 - 0xFF
Command 11		0x00 - 0xFF
Command 12		0x00 - 0xFF
Command 13		0x00 - 0xFF
Command 14		0x00 - 0xFF
Command 15		0x00 - 0xFF

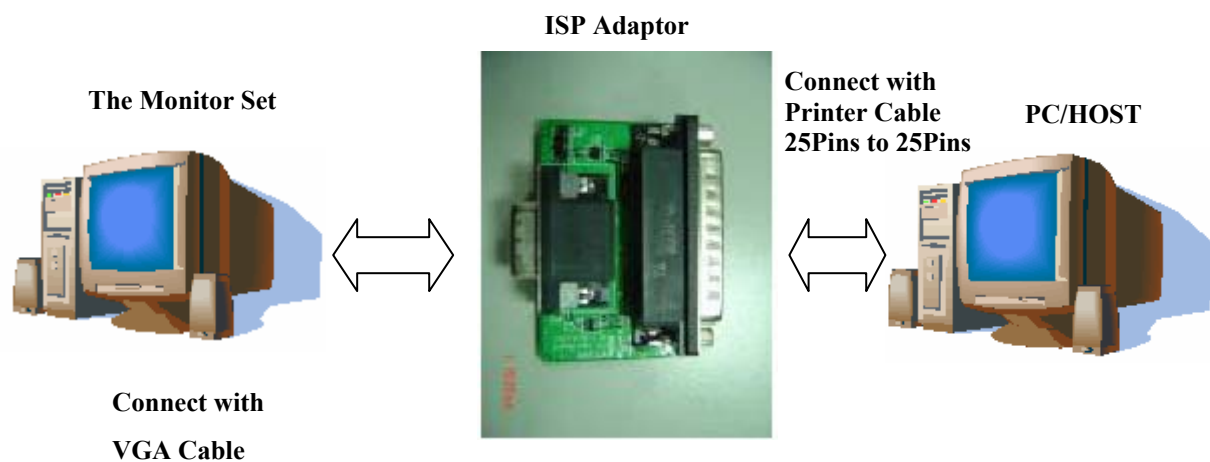
Command No: 2

OK CLEAR

8. ISP Adaptor Schematic



9. Adaptor Linking



Packing For Shipping

1. Packing Procedure

1.1 Paste protection film to protect the monitor. (Figure 1)

1.2 Put the monitor in the PE bag and seal the bag with tape. (Figure 2)



Figure 1



Figure 2

1.3 Put the cushion into the carton then place the monitor on the cushion. (Figure 3)

1.4 Put the cushion then place all the accessories into the carton. As last, close the carton and seal it with tape. (Figure 4)



Figure 3



Figure 4

Monitor Assembly and Disassembly

1 Separate Stand Assy

1.1 Remove Stand Cover

Step 1 :

Loose and remove 4 screws



Step 2 :

Remove the Stand Assy



Step 3 :

Completed.

2 Separate Rear Cover (Rear Case Assy)

Separate Bezel hooks to take Bezel and Rear Cover apart.

Step 1 :

Loose and remove 3 screws.



Step 2 :

Separate Bezel hooks to take Bezel and Rear Cover apart.



Step 3 :

Remove Rear Cover.



Step 4 :

Completed.

3 Remove Power Board and AD Board

3.1 Remove Metal Cover

Step 1 :

Remove FFC from OSD Board.



Step 2 :

Lift up LCD module and remove bezel.



Step 3 :

Remove 4 pieces of Backlight wires.

(Attention red cable & blue cable)



Step 4 :

Loose and remove 4 screws.



Step 5 :

Loose and remove 2 screws.



Step 6 :

Loose and remove 4 screws.



Step 7 :

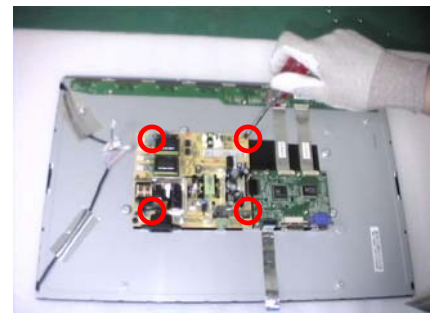
Remove the PCBA Cover



3.2 Remove Power Board and AD Board

Step 1 :

Loose and remove 4 screws.



Step 2 :

Remove Lips Board



Step 3 :

Remove 2 pieces of FFCs.



Step 4 :

Remove the FFC.



Step 5 :

Loose and remove 4 screws.



Step 6 :

Remove AD PCBA.

Step7 :

Completed.



4 Change New AD Board and Power Board

Step 1 :

Place new AD Board.
And fasten 4 fixed screws.



Step 2 :

Fasten 4 fixed screws.



Step 3 :

Insert FFC.



Step 4 :

Insert 2 pieces of FFCs .



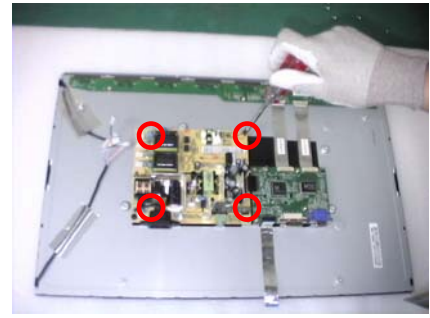
Step 5 :

Insert new Lips Board.



Step 6 :

Fasten 4 fixed screws.

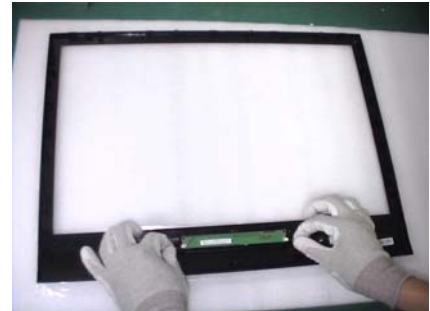


Step 7 :Completed.

5. Remove OSD Board

Step 1 :

Separate both Audio Cable.



Step 2 :

Take OSD Board apart.



Step 3:

Completed.



6.Change New OSD Board

Step 1 :

Place New OSD Board.



Step 2 :

Insert Audio cable to connectors of New
OSD Board.



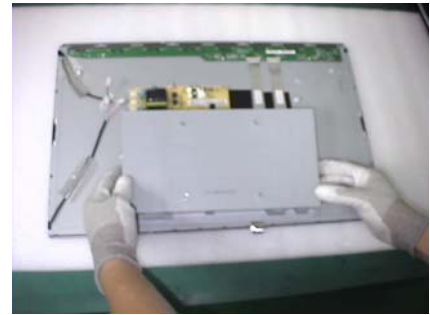
Step 3:

Completed.

7. Add Cover to AD PCB Heatsink

Step 1 :

Join the PCB Cover.



Step 2 :

Fasten 4 fixed screws.



Step 3 :

Fasten 2 fixed screws



Step 4 :

Fasten 4 fixed screws.



Step 5 :

Insert 4 pieces of Backlight wires.



Step 6 :

Join LCD module and remove bezel.



Step 7 :

Insert FFC.



Step 8 :

Completed.

8. Rear Assy & Stand Assembly

Step 1 :

Place Rear Cover.



Step 2 :

Fasten 3 fixed screws.



Step 3 :

Place the Stand Assy.



Step 4 :

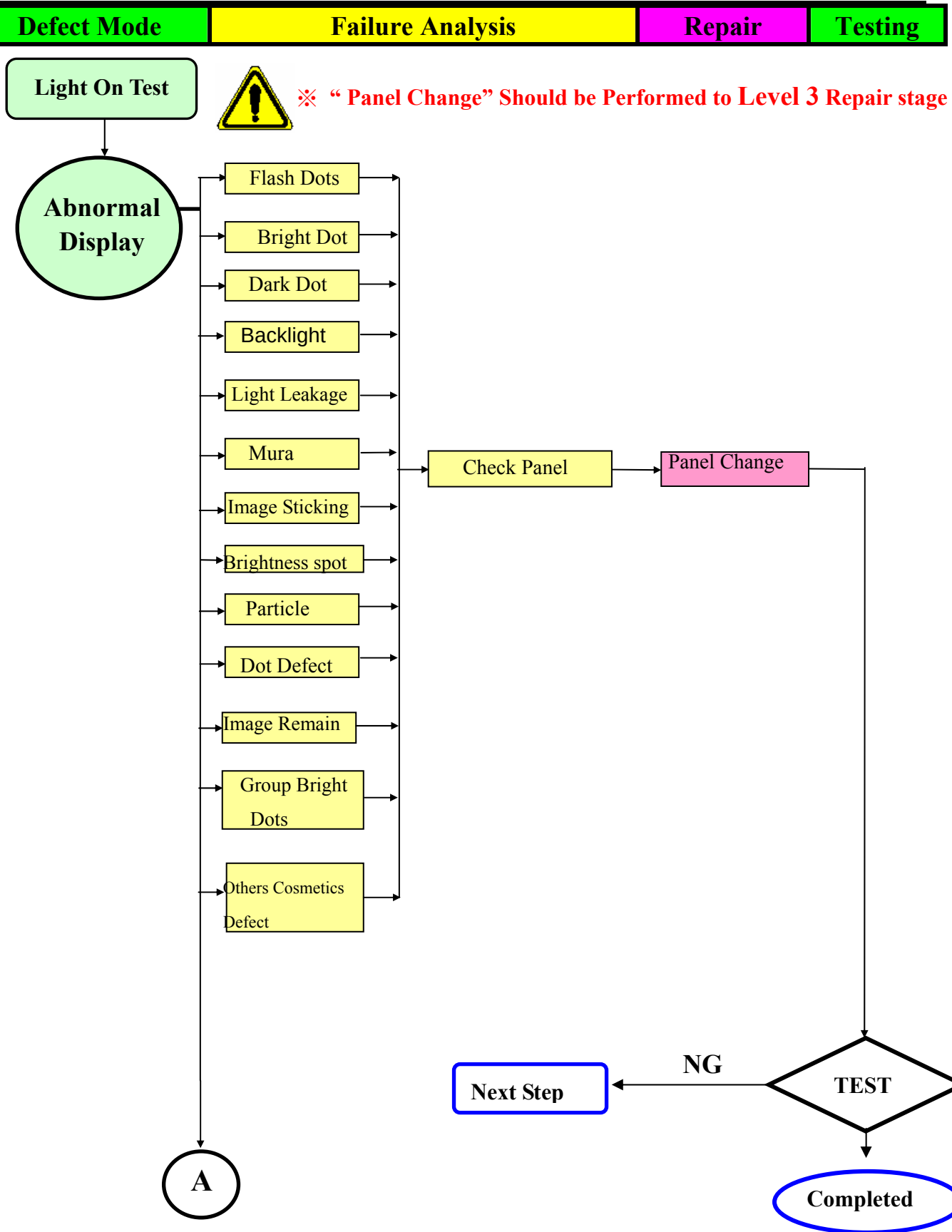
Fasten 4 fixed screws.

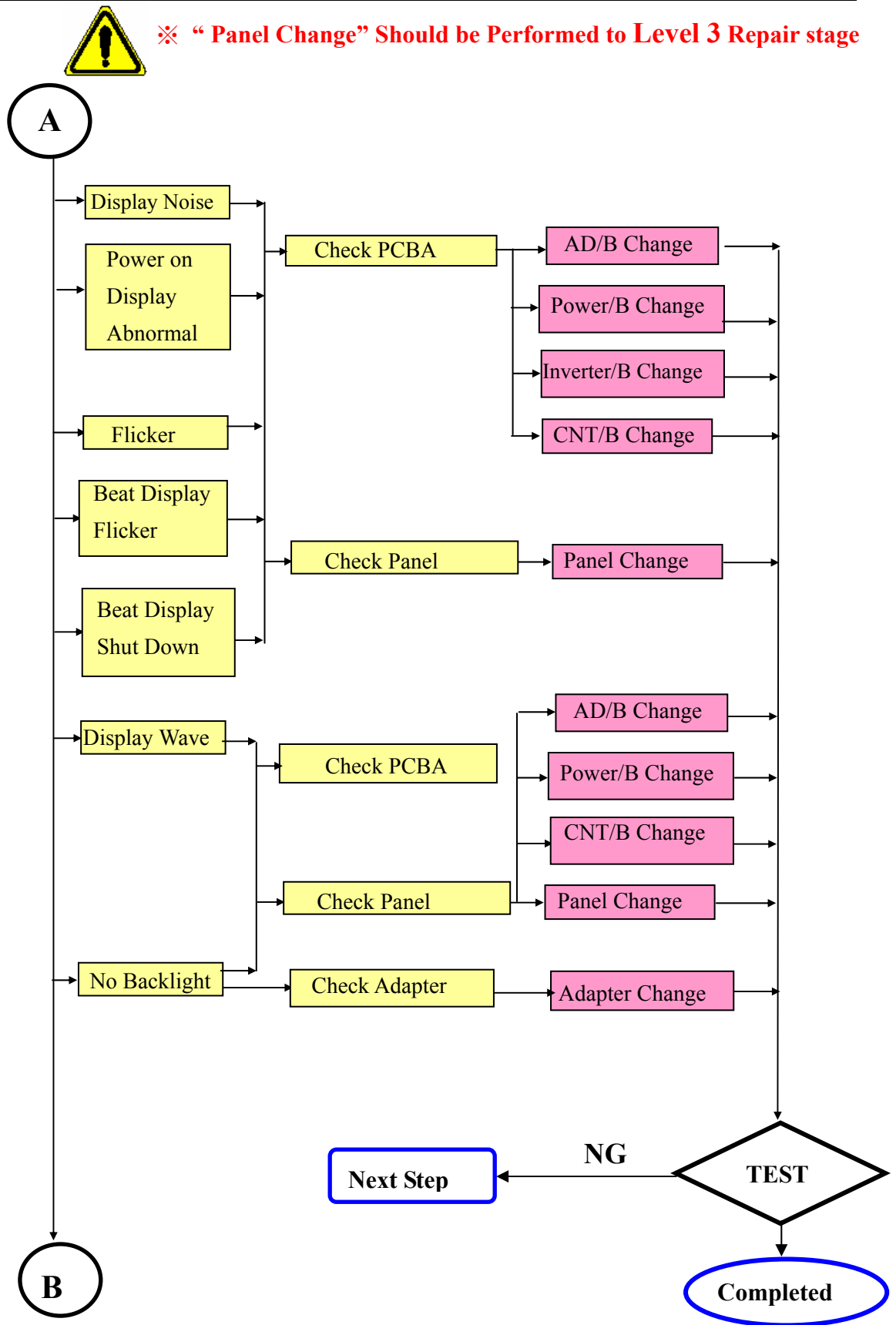


Step 5 :

Completed.

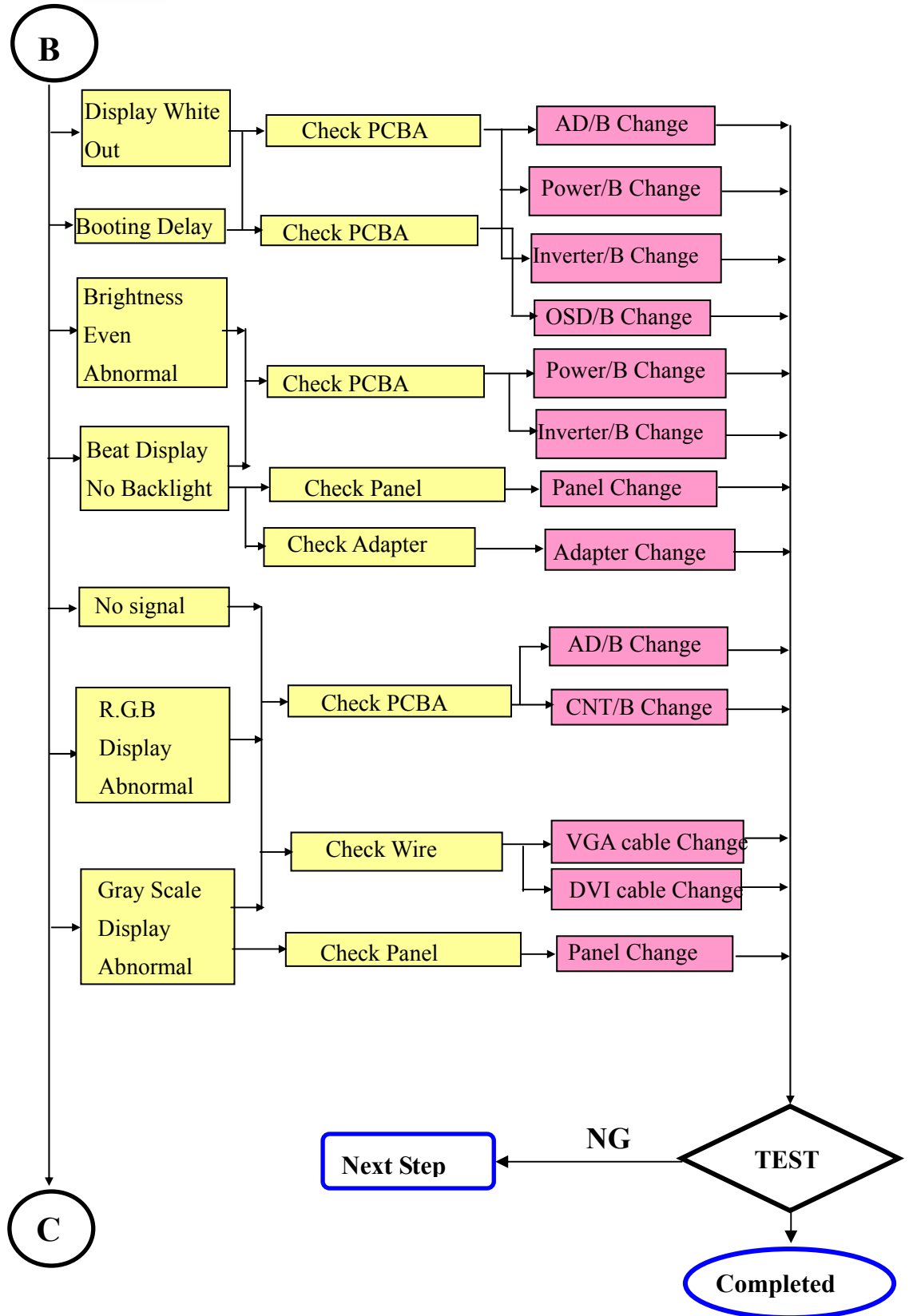
6. Troubleshooting Flow Chart





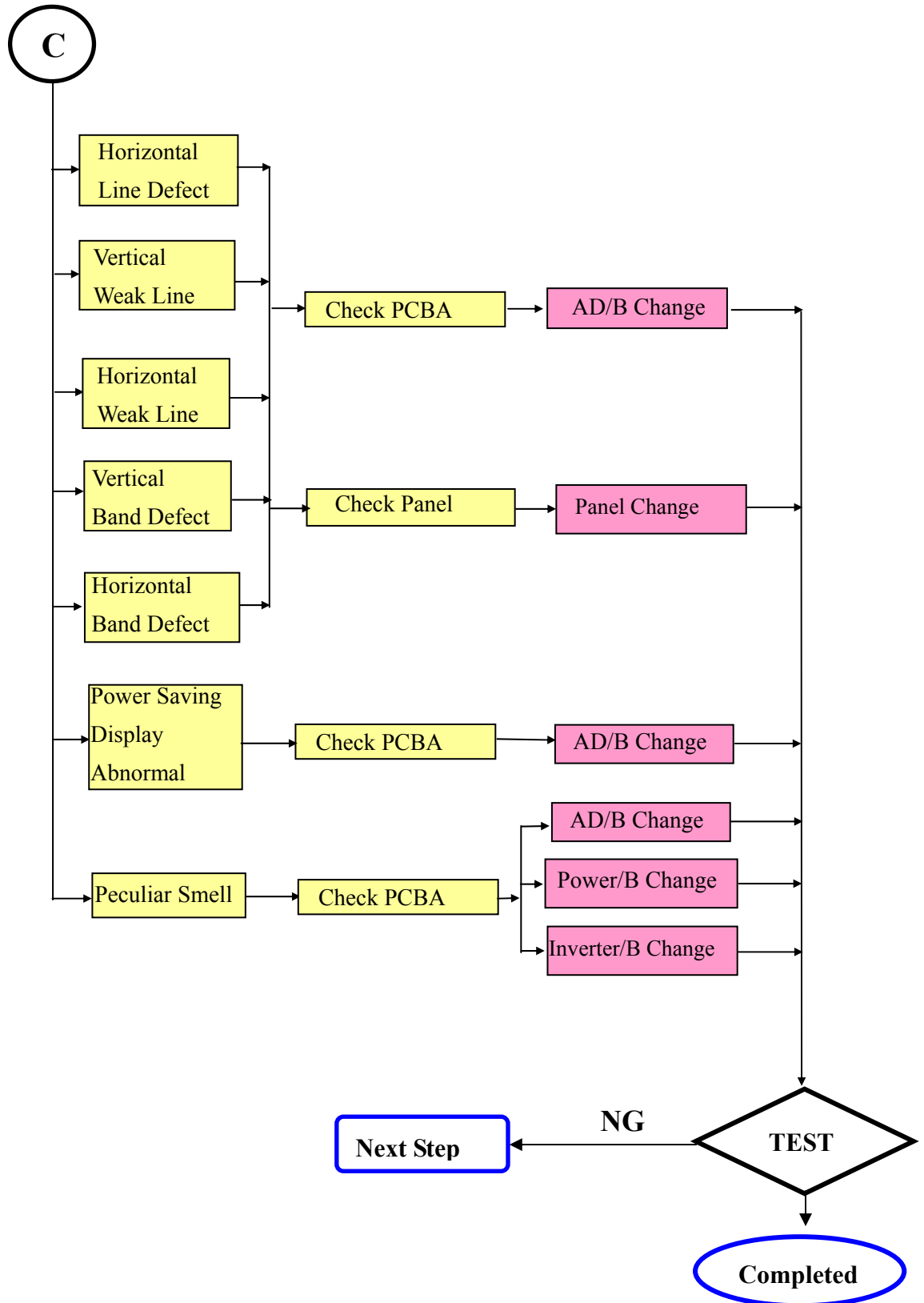


※ “Panel Change” Should be Performed to Level 3 Repair stage



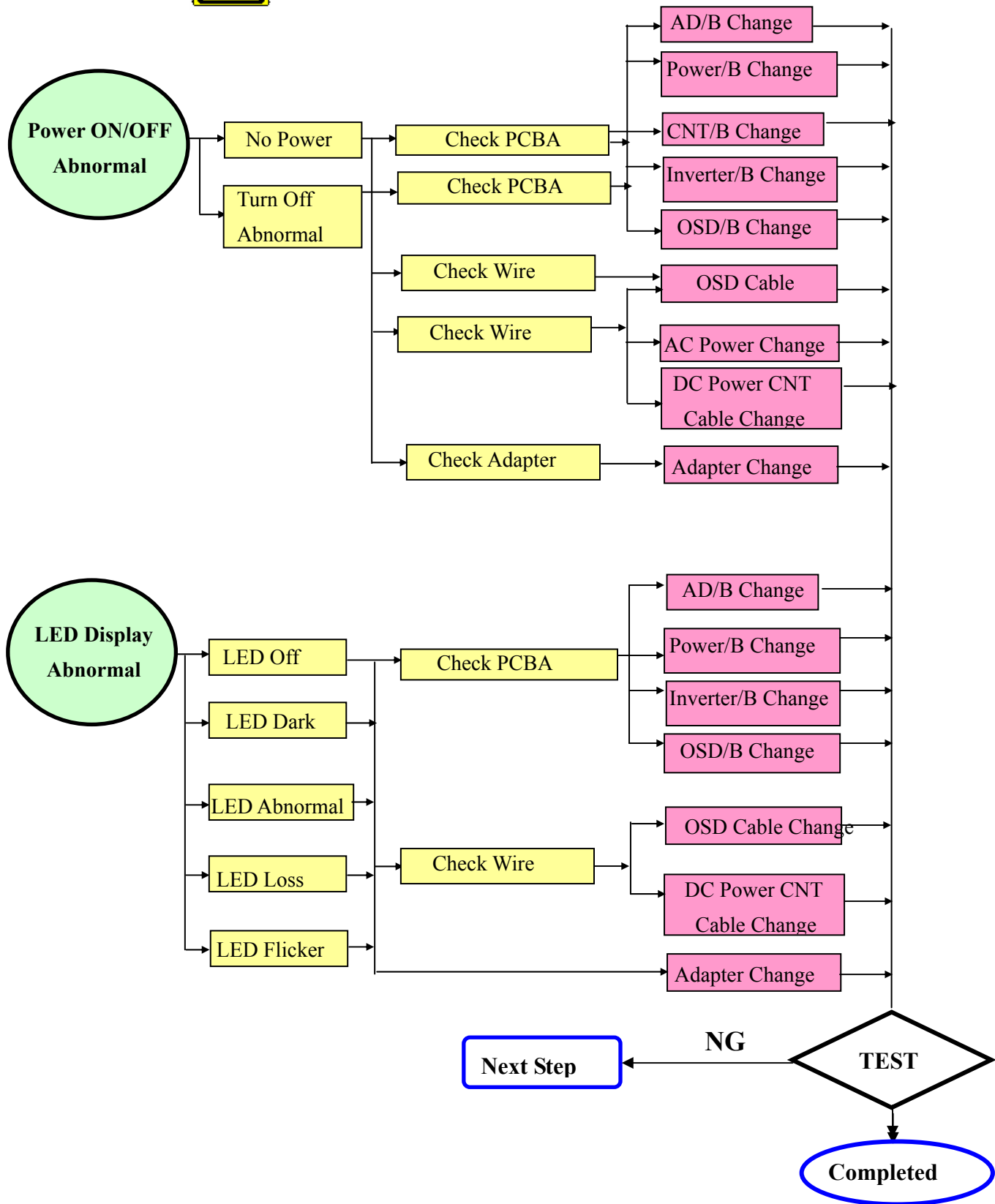


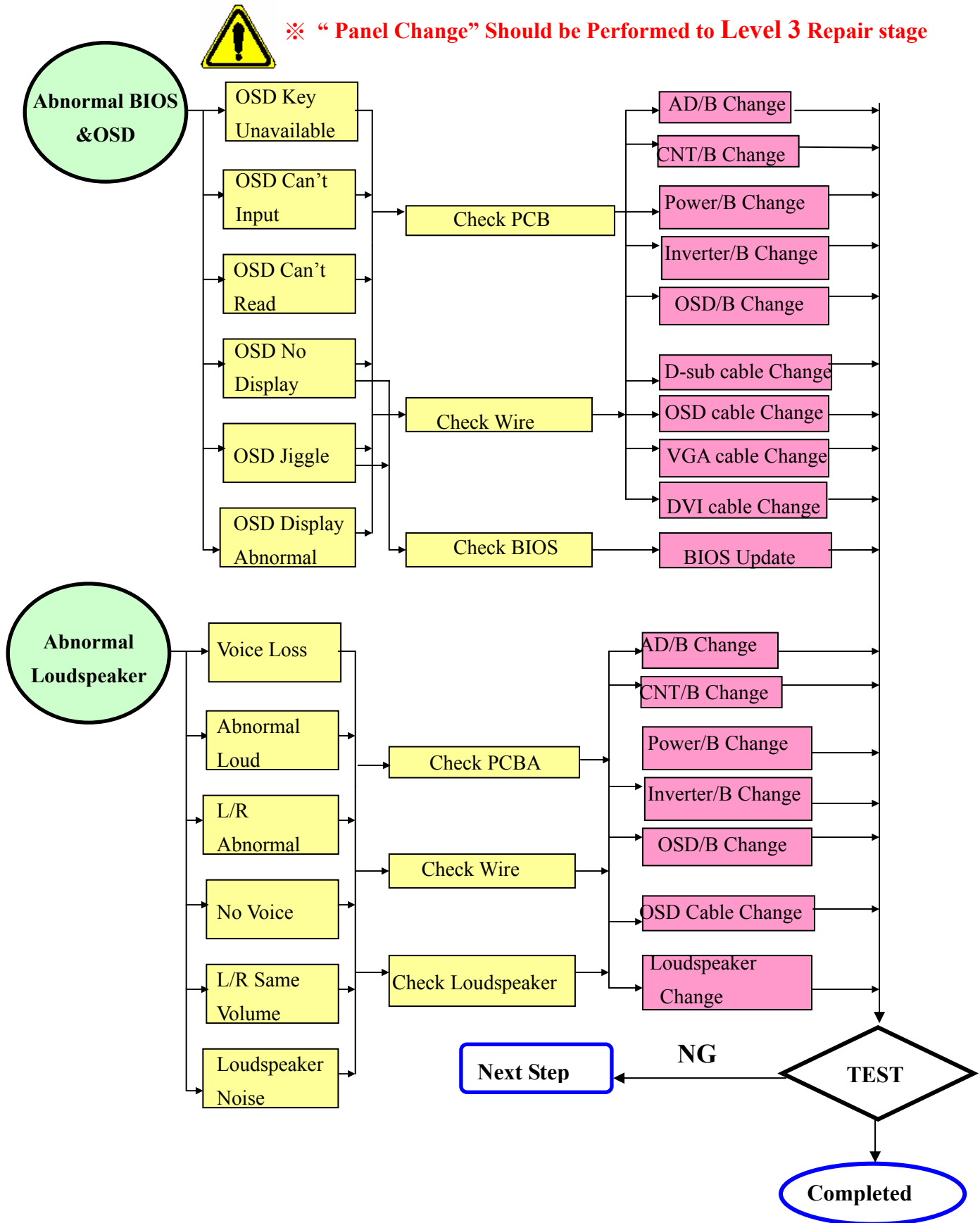
※ “Panel Change” Should be Performed to Level 3 Repair stage





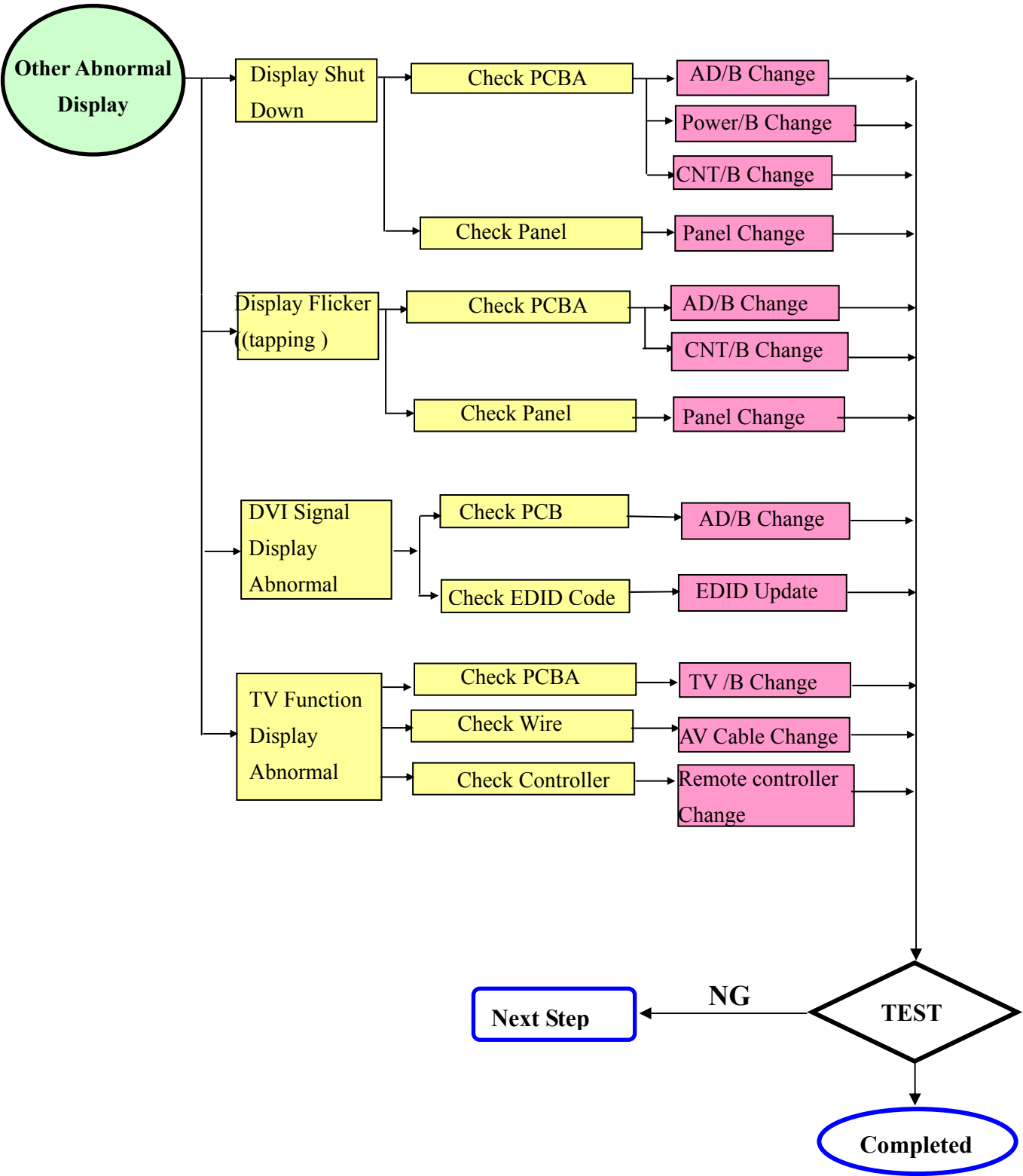
※ “Panel Change” Should be Performed to Level 3 Repair stage







※ “Panel Change” Should be Performed to Level 3 Repair stage



Trouble Shooting Analysis

Check the information in this section to see if the problems can be solved before requesting repair.

Note : The consumers are only allowed to solve the problems described as below. Any unauthorized product modification, or failure to follow instructions supplied with the product will end the warranty immediately.

■ No image

- Make sure power button is ON.
- Check whether the LCD monitor and computer power cords are plugged and whether there is a supply of power.

■ No Signal Input

- Check the signal connection between the computer and LCD monitor.

■ “Out of Range”

- Check the computer image output resolution and frequency and compare the value with the preset values (Please refer to [Appendix-Display Mode]).

■ Fuzzy Image

- Adjust Phase.

■ Image too bright

- Adjust brightness and contrast by OSD.

■ Image too dark

- Adjust brightness and contrast by OSD.

■ Irregular image

- Check the signal connection between the computer and LCD monitor.
- Perform Auto Adjust.

■ Distorted image

- Reset the LCD monitor
- Take off extra accessories (such as signal extension cord).

■ Image is not centered

- Use OSD Image Menu to adjust H_Position and V_Position.
- Check image size setting.
- Perform Auto Adjust.

■ Size is not appropriate

- Use OSD Image Menu to adjust H_Position and V_Position.
- Check image size setting.
- Perform Auto Adjust.

■ Uneven color

- Use OSD Color Menu to adjust color setting.

■ Color too dark

- Use OSD Color Menu to adjust color setting.

■ Dark area distorted

- Use OSD Color Menu to adjust color setting.

■ White color is not white

- Use OSD Color Menu to adjust color setting.

7. Recommended Spare Parts List

RECOMMENDED SPARE PARTS LIST (VG2230wm-1)

ViewSonic Model Number: VS11422

Serial No. Prefix: QC9

Rev: 1a

Item	Description	ECR/ECN	ViewSonic P/N	Ref. P/N	Location	Universal number#
1	Accessories:					
2	Power Cord,LP-53 & VCTF 0.75mm^2 3C		A-00005071	32-D002330		
3	PC Board Assembly:					
4	On Screen Display Board, Rev.01		B-00005704	35-D007990		
5	Power Supply Board (Lips W/ Audio Vo.7)		B-00008026	27-D009542		
6	Main Board Rev.04		B-00008027	35-D010627		
7	Sub Board - PCBA Rev.02,ODM		B-00008119	35-D013204		
8	Cabinets:					
9	Base Assembly		C-00008136	40-D013495		
10	Back Cover - A220Z1-H07		C-00008137	40-D013273		
11	Front Panel - (TY4818A)		C-00008138	40-D013268		
12	Cables:					
13	DVI Cable, S/L, 1.8M, W/2F		CB-00002083	32F0000004		
14	Flat Cable (FFC,862P051786A/CFC2109,15 Pins)		CB-00005676	32-D007464		
15	Audio Cable (Accessory Black, 28AWG)		CB-00005678	32F2818011		
16	Accessory Cable,D-Sub, (30AWG)		CB-00005851	32-D002132		
17	Flat Cable (FFC 36 Pins)		CB-00008014	32-D008479		
18	Flat Cable - 6 Pins,Length 260mm,P 1.0mm		CB-00008042	32-D013272		
19	Documentation:					
20	Safety Label for ,A220Z1-H07,160 mmx30 mm		DC-00008131	77-D013322		
21	Carton Label for ,A220Z1-H07,76.2 mmx76.2 mm		DC-00008132	77-D013175		
22	CD-ROM		DC-00008133	76-D013171		
23	Hardware:					
24	SCREW,3,P=0.5 mm,L=4 mm,Pan Head,Phillips Cross Recess		HW-00000553	42A9930008		
25	Screw, M4, P=0.7 mm, L=8 mm Round Head		HW-00004042	42-D000649		
26	SCREW,M4,P=0.7 mm,L=15 mm		HW-00005884	42-D001756		
27	SCREW,4,P=0 mm,L=11.8 mm,Hexagon Stand Off,Socket		HW-00006041	42A9940007		
28	Screw - T3,P=1.058 mm,L=5 mm,Pan Head		HW-00008024	42-D003574		
29	Screw - M3,P=0.5 mm,L=6 mm,Binding Head		HW-00008025	42-D005390		
30	Miscellaneous:					
31	Tape Security, OPP,L900xW50x0.045mm		M-00000560	7345511002		
32	Packing Material:					
33	PE Bag,600 mmx650 mmx0.13 mm		P-00008033	78-D009624		
34	Foam - Top		P-00008133	78-D013271		
35	Foam - Bottom White		P-00008134	78-D013275		
36	Craft Box		P-00008135	78-D013323		
37	Plastics:					
38	Panel Cover (Panel Protector Film)		PL-00008008	73-D009538		

Remark 1: Above listed items are examples, supplier can expand the rows to add more necessary items.

Remark 2: All revised RSPLs with newly added items or any change made should be highlighted and correlated with the ECN/ECR approved by ViewSonic Corporation. This is to eliminate repeated cross checks of each item between this version and prior versions.

BOM LIST (VG2230wm-1)

ViewSonic Model Number: VS11422

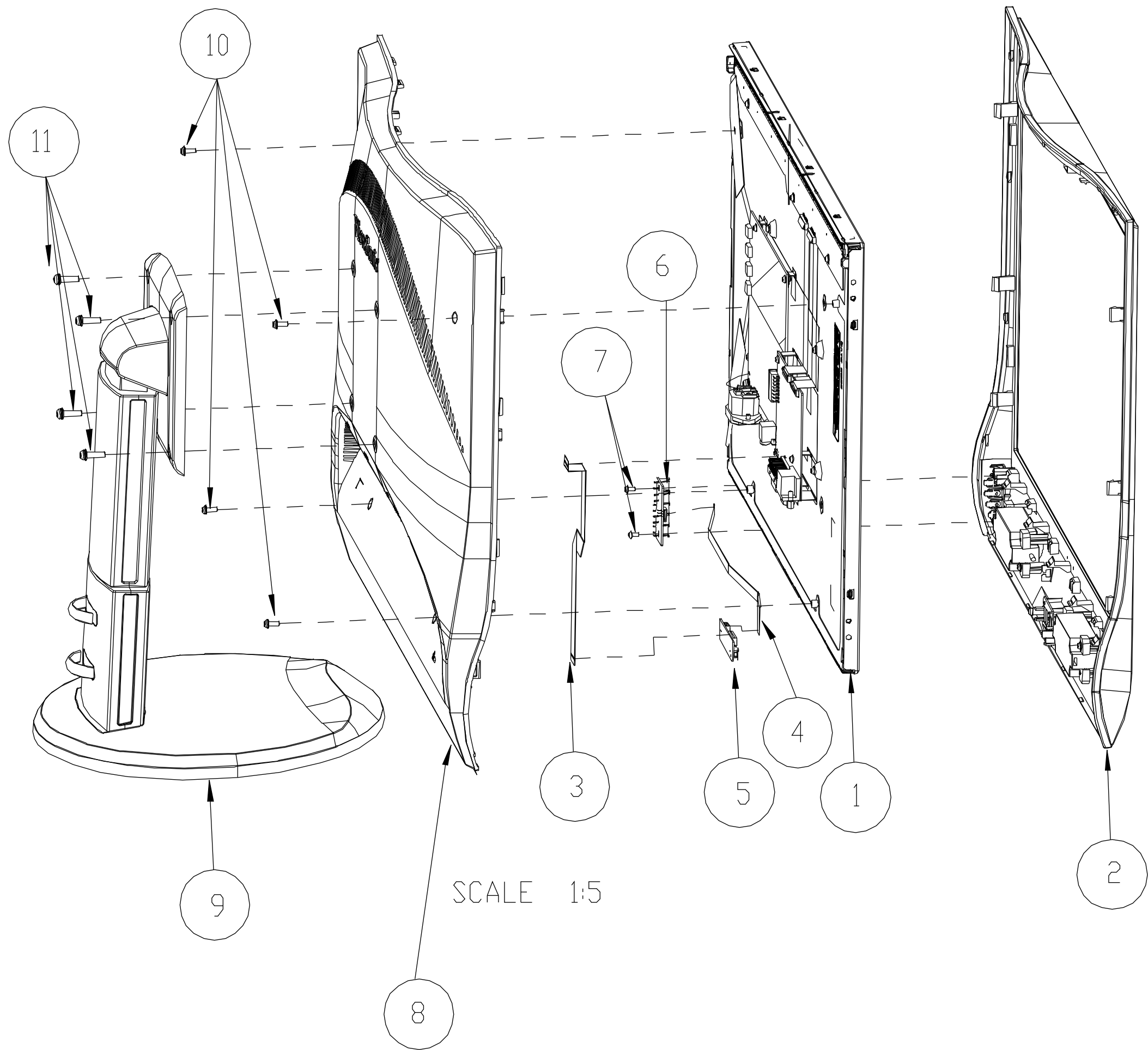
Rev: 1a

Serial No. Prefix: QC9

Item	ViewSonic P/N	Ref. P/N	Description	Location	Universal number#	Q'ty
1	N/A	73-C000047	ACF,COG,AC-8405Z-23 1.5mmX100M,100000 mmx1.5 mm,Hitachi Chemical,COG-ACF,Green I			0.0028
2	N/A	36-D006411	Driver IC,COG,Scan,M170E5-L09,HX8653-A000PD400,240/263/256Channel,Himax,(HX8633 shrank version),Green II			4
3	N/A	L4M003XXXX	22"wide_TN, Photo Spacer ,Coming 0.7mm Glass , Resin/BM(Panel Base)			1
4	N/A	L4M003XXBI	22"wide_TN, Photo Spacer ,Coming 0.7mm Glass , Resin/BM(Sheet Base)			0.0833
5	N/A	74-D007599	Polarizer,TFT,Degree 135,478.16 mmx300.2 mmx0.215 mm,XT300CMM220Z1H0B,M220Z1,LG Chem,LG HCR EWV			1
6	N/A	74-D007598	Polarizer,TFT,Degree 135,478.16 mmx300.2 mmx0.215 mm,XT300CMM220Z1H0B,M220Z1,LG Chem,LG HCR EWV			1
7	N/A	36-D007038	Driver IC,COF,Data,M220Z1-L01,HX8019-A07BCBC5,COF,6 bit,642Channel,Himax,Green II			8
8	N/A	73-D008216	ACF,COF,AC-4255U-16,200000 mmx1.2 mm,Hitachi Chemical,Green II			0.0025
9	N/A	73-D002676	ACF,PCB,AC-9825R-35,100000 mmx1.5 mm,Hitachi Chemical,PCB-ACF,Green I			0.005
10	N/A	35-D010045	PCBA for ,A220Z1-Z01-H,A220Z1-Z01-H-X,1101-03,Rev.04,USI/ITC,ODM,Green II			1
11	N/A	7349951002	Silicone,TORAY/-9187L,330g			0.5
12	HW-00000553	42A9930008	SCREW,3,P=0.5 mm,L=4 mm,Pan Head,Phillips Cross Recess,Hama Naka Motogawa Hama Naka Shoukin Shiho Shin Yee Shye Ching,Green I			13
13	HW-00006041	42A9940007	SCREW,4,P=0 mm,L=11.8 mm,Hexagon Stand Off,Socket,Shiho Shin Yee Shye Ching Hama Naka Motogawa,Green I			4
14	HW-00004042	42-D000649	SCREW,M4,P=0.7 mm,L=8 mm,Round Head,Phillips Cross Recess,plate color Zn,Screw_with_Washer,Shye Ching Hama Naka Motogawa Shin Yee,head D8,Green I			1
15	N/A	41-D007402	Metal Frame Front,M220Z1-L01,SECC 0.6t,Fomgder/CLT_Metal,Green II			1
16	N/A	44-D008027	Backlight Unit,A220Z1,Forhouse/ROE,Green II			1
17	N/A	41-D008024	Cover AD Assy,A190A2,SECC,Jiin Ming,Left_Side 4 connector_VESA100*100,Green II			1
18	CB-00008014	32-D008479	FFC,CFC2128/862P060068D,36 Pins,Tennsure/Hung Fu, AL foil,Green I			2
19	HW-00008002	42-D009237	SCREW,M3,P=0.5 mm,L=2.5 mm,Pan Head,Phillips Cross Recess,Shye Ching,Green II			3
20	B-00008026	27-D009542	Lips With Audio,DAC-19M009 AF,01 A,5 V/3 A,13.8 V0.7 A,I TYPE,7 mA,1710 V,Delta Dongguan_LIPS,Green II			1
21	B-00008027	35-D010627	PCBA for ,A220Z1-Z01-H,A170E2-E03-H-S6,1101-02,Rev.04,ITC USI,ODM,RTD2120S-LF,Green II			1
22	HW-00008024	42-D003574	SCREW,T3,P=1.058 mm,L=5 mm,Pan Head,Phillips Cross Recess,Hama Naka Motogawa Shye Ching,Green II			2
23	HW-00008025	42-D005390	SCREW,M3,P=0.5 mm,L=6 mm,Binding Head,Cross with Slotted Recess,Black Zn,Shye Ching Shin Yee,Green II			4
24	CB-00005676	32-D007464	FFC,862P051786A/CFC2109,15 Pins,Hung Fu/TennRich,Green II			1
25	B-00005704	35-D007990	PCBA for ,A201P1-P01-H,A201P1-P01-H-K2,1101-01,Rev.01,ITC USI,ODM,Green II			1
26	B-00008119	35-D013204	PCBA for ,A201P1-P01-H,A201P1-P01-H-K1,1101-02,Rev.02,ITC TSMT,ODM,Green II			1
27	CB-00008042	32-D013272	FFC,6 Pins,Tennsure_FFC Hung Fu,Length 260mm,P 1.0mm,Green II			1
28	C-00008138	40-D013268	Bezel Assy,A220Z1-H07,BLACK(M1077)/SILVER(TY4818A),Push Power,Green II			1
29	C-00008137	40-D013273	Rear Assy,A220Z1-H07,BLACK (ABS PA757 J01),Push Power,Audio_in+DVI-D,Green II			1
30	HW-00005884	42-D001756	SCREW,M4,P=0.7 mm,L=15 mm,Round Head,Phillips Cross Recess,Zn(Black),Screw_with_Washer,Hama Naka Motogawa Shye Ching Shin Yee,Green I			4
31	C-00008136	40-D013495	Stand Seat Assy,A220Z1-H07,Black,ViewSonic,VSC P/N:c-00006113,Green I			1
32	PL-00008008	73-D009538	Panel Protector Film,A220Z1-H03,XG-536 T=0.1mm,Just Enter,BLANK			1
33	N/A	77-D013177	SN Label for ,A220Z1-H07,50 mmx25 mm,Kunshan Hwakuan Chang Huang,VSC_VG2230wm,Green II			1
34	DC-00008131	77-D013322	Safety Label for ,A220Z1-H07,160 mmx30 mm,Kunshan Hwakuan Chang Huang,VSC_VG2230wm,Green II			1
35	HW-00002076	7841595111	Corner Protector,paper,50 mmx50 mmx1850 mm,Green II			0.2
36	N/A	7841595171	(AA),1140 mm,900 mm,11 mm,Non Green			0.05
37	DC-00000586	7741999141	Module Label,A190E2-H03,75 mm,40 mm,Non Green			0.05
38	M-00000560	7345511002	Tape,A170E1-H0P,900 mmx50 mmx0 mm,Symbio,OPP			0.007
39	N/A	78-D001493	Pallet,A170E1-H01,Wooden,1150 mmx920 mmx135 mm,Ming Li/Hua Sun Paper/Shanghai Hang Wei 8,Green II			0.05
40	P-00008033	78-D009624	Bag,600 mmx650 mmx0.13 mm,PE Foam,650,Huang Jyii,Green II			1
41	DC-00008132	77-D013175	Carton Label for ,A220Z1-H07,76.2 mmx76.2 mm,Chang Huang Kunshan Hwakuan,VSC_VG2230wm,Green II			1
42	DC-00008133	76-D013171	MENU for A220Z1-H07,Complex,1C,Yi Ching Car Tong Kunshan,VSC_VG2230wm CD-ROM,Green II			1
43	P-00008133	78-D013271	Cushion,A220Z1-H07,EPS,White,560 mmx290 mmx175 mm,Li Ta,Top,Green II			1
44	N/A	79-D013274	Shipping Package Information for ,A220Z1-H07,VSC			1
45	P-00008134	78-D013275	Cushion,A220Z1-H07,EPS,White,560 mmx290 mmx150 mm,Li Ta,Bottom,Green II			1

Item	ViewSonic P/N	Ref. P/N	Description	Location	Universal number#	Q'ty
46	P-00008135	78-D013323	Carton,A220Z1-H07,515 mmx293 mmx565 mm,Chen Yi Paper Yuen Foong Yu Suzhou Chen Yi Ningbo,VSC_VG2230wm,Green II			1
47	N/A	10-D013196	Software (EDID_D-SUB),A220Z1,VSCA21EA00,VSC,Checksum(76),VG2230wm, Analog Port,Green II			1
48	N/A	10-D013195	Software (EDID_DVI),A220Z1,VSCA21ED00,VSC,Checksum(CB),VG2230wm, Digital Port,Green II			1
49	N/A	10-D013194	Software (BIOS),A220Z1,22Z1LR6000,ViewSonic,Checksum(Bank1:0x85, Bank2:0x02),RSDS, RTD2120, Dual+Audio/Analog+Audio,Green II			1
50	CB-00002083	32F0000004	Accessory Cable,DVI,Black,Jceprocable,DVI-D(M) TO DVI-D(M),S/L,W/2F,Green I			1
51	CB-00005678	32F2818011	Accessory Cable,Audio,Black,Jhen Vei,A170E1-H01,28AWG,Green I			1
52	CB-00005851	32-D002132	Accessory Cable,D-Sub,JV-4777,Black,Pins-Pins,Jhen Vei,30AWG,Reduce Shield Rate,Green I			1
53	A-00005071	32-D002330	Power Cord,LP-53 & VCTF 0.75mm^2 3C 6 BLACK & LS-13J,BLACK,BSMI,1800 mm,Linetek,Green I			1

8. Exploded Diagram and Exploded Parts List



EXPLODED PARTS LIST (VG2230wm-1)

ViewSonic Model Number: VS11422

Rev: 1a

Item	ViewSonic P/N	Ref. P/N	Description	Q'ty
1	N/A	PM0ZFH0R00	ISM,A220Z1-H07	1
2	C-00008138	40-D013268	Bezel Assy,A220Z1-H07	1
3	CB-00005676	32-D007464	FCC,15 Pins,A220Z1-H07,ISM-Powerkey	1
4	CB-00008042	32-D013272	FCC,6 Pins,A220Z1-H07,OSD-Powerkey	1
5	N/A	32-D013204	PCBA for ,A201P1-P01-H-K1	1
6	B-00005704	35-D007990	PCBA for ,A201P1-P01-H-K2	1
7	HW-00008024	42-D003574	SCREW,T3,P=1.25 mm,L=5 mm	2
8	C-00008137	40-D013273	Rear Assy,A220Z1-H07	1
9	C-00008136	40-D013495	Stand Seat Assy,A220Z1-H07	1
10	HW-00008025	42-D005390	SCREW,M3,P=0.5 mm,L=6 mm	4
11	HW-00005884	42-D001756	SCREW,M4,P=0.7 mm,L=15 mm	4

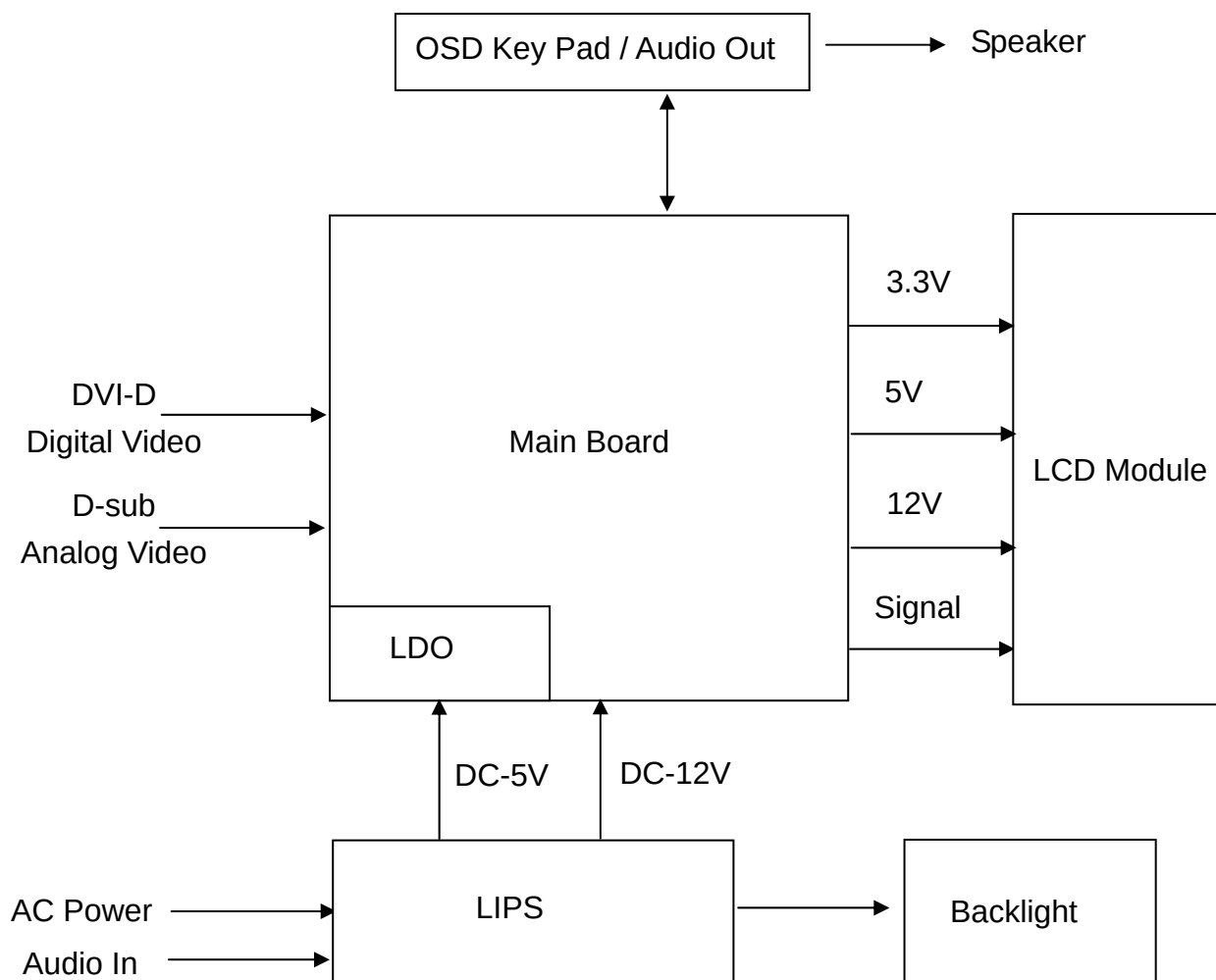
PACKING PARTS LIST (VG2230wm-1)

ViewSonic Model Number: VS11422

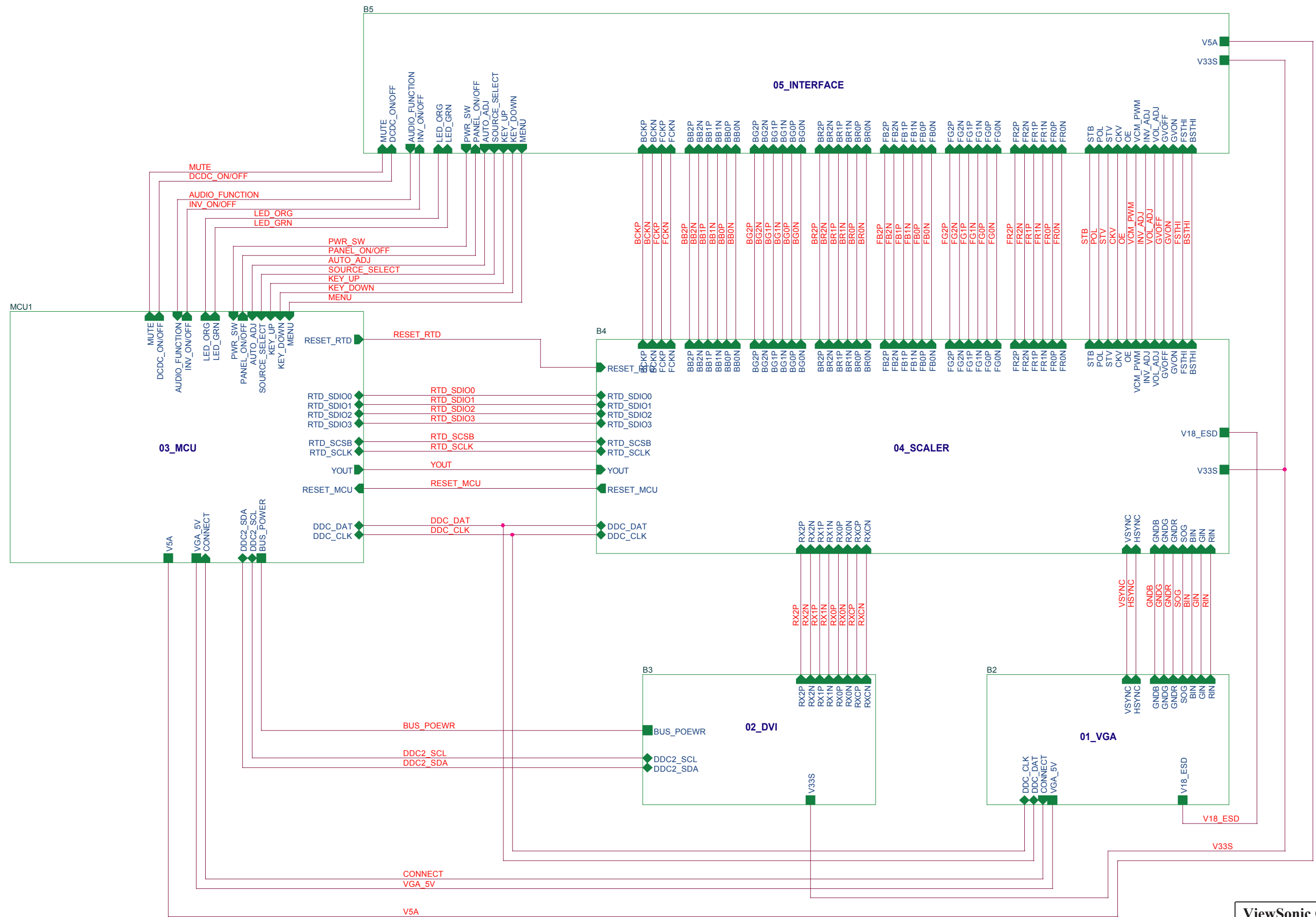
Rev: 1a

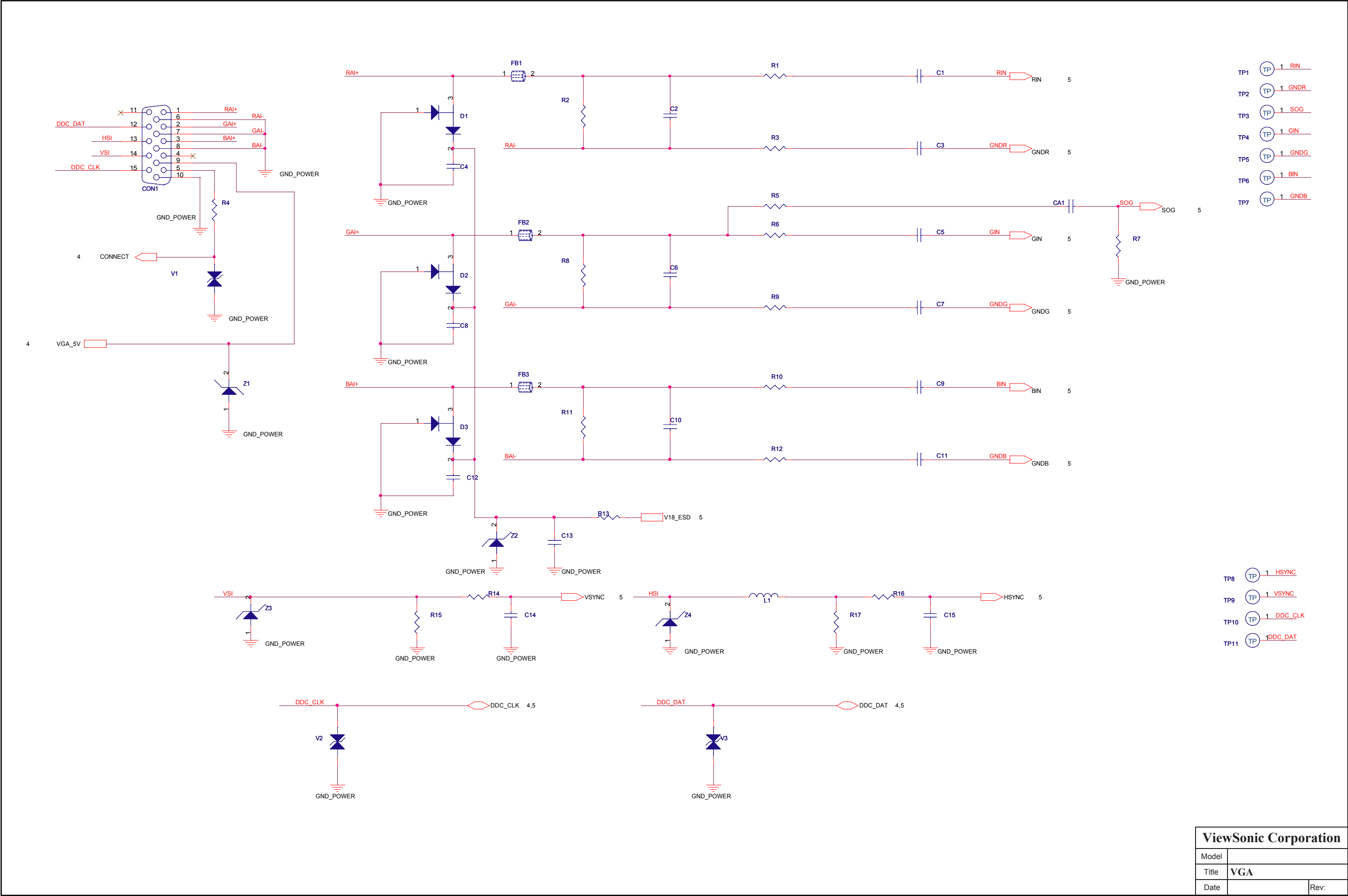
Item	ViewSonic P/N	Ref. P/N	Description	Q'ty
1		VG2230wm	LCD Monitor	1
2	P-00008033	78-D009624	PE Foam Bag	1
3	P-00008135	78-D013323	Carton	1
4	P-00008134	78-D013275	EPS Foam (Bottom)	1
5	P-00008133	78-D013271	EPS Foam(Top)	1
6	A-00005071	32-D002330	Power Cord	1
7	CB-00005851	32-D002132	Monitor Cable	1
8	CB-00005678	32F2818011	Audio Cable	1
9	CB-00002083	32F0000004	DVI Cable	1
10	DC-00008133	76-D013171	Menu (Quick Setup)	1
11	N/A	Different region (refer to BOM)	Customer Label	1
12	N/A	Different region (refer to BOM)	Warranty Registration card	1

9. Block Diagram

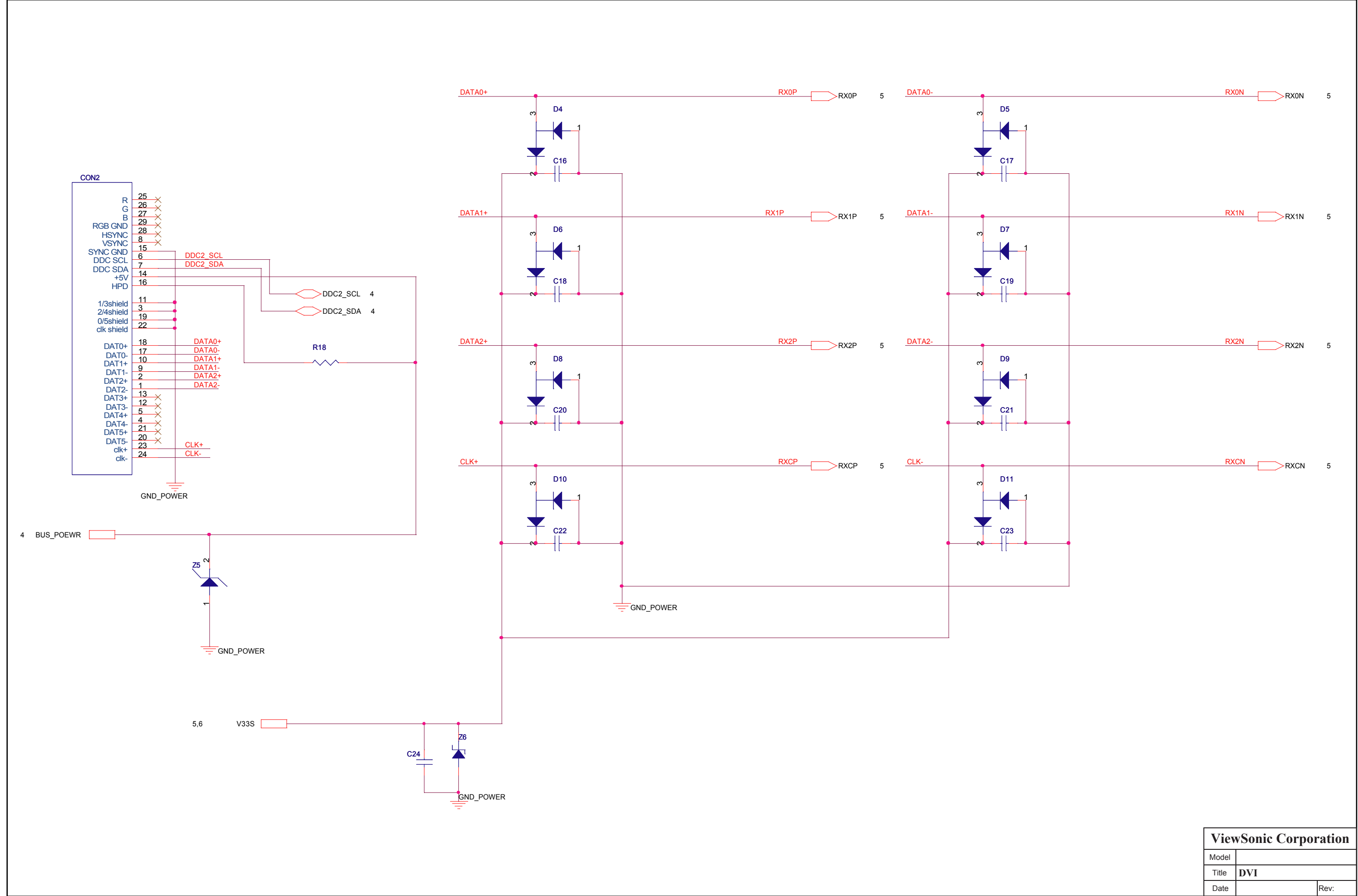


10. Schematic Diagrams

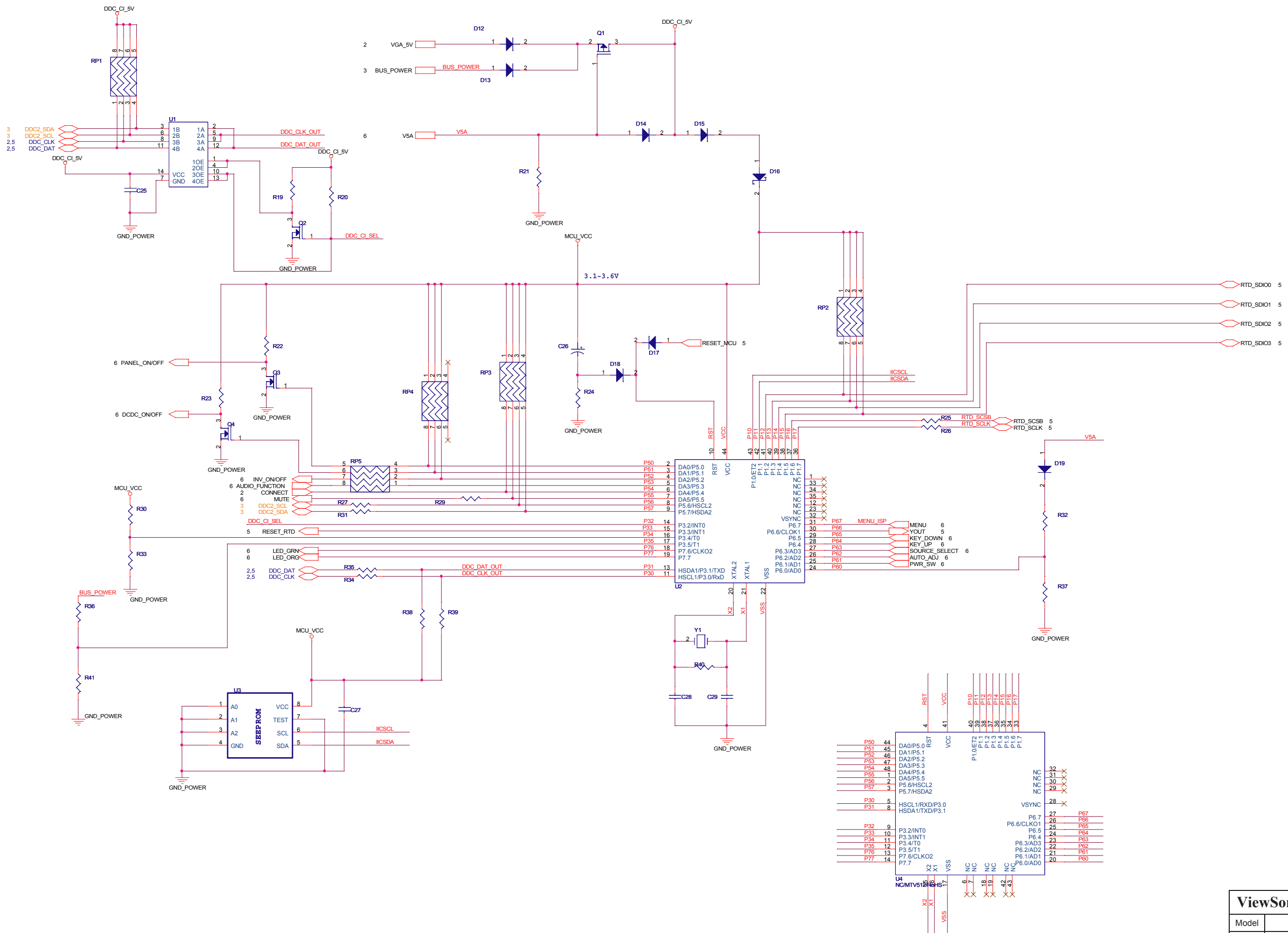




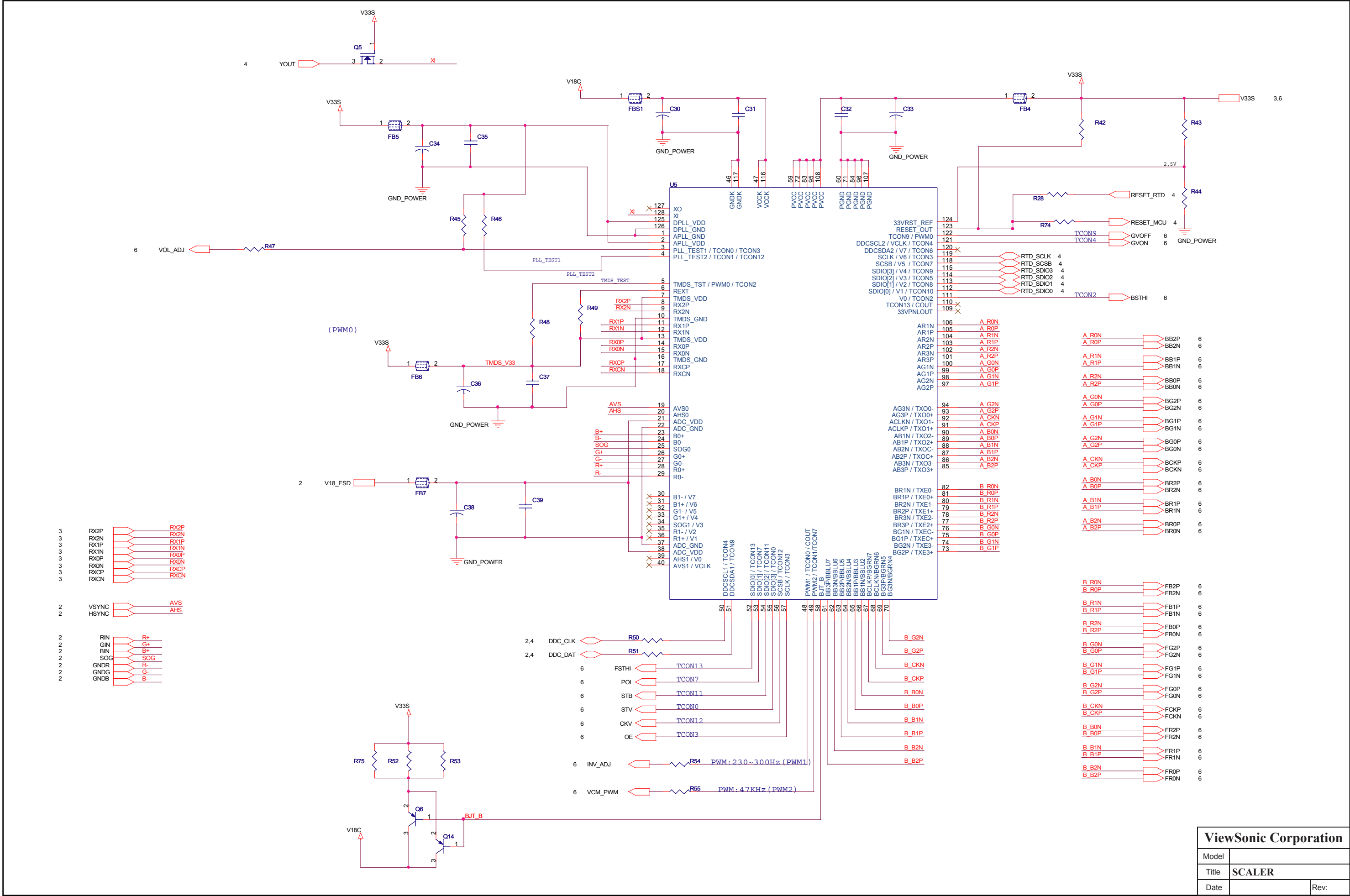
ViewSonic Corporation		
Model		
Title	VGA	
Date		Rev:

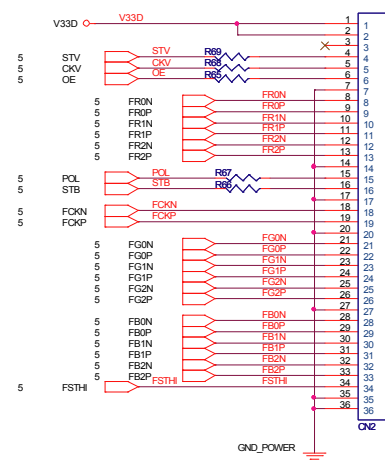
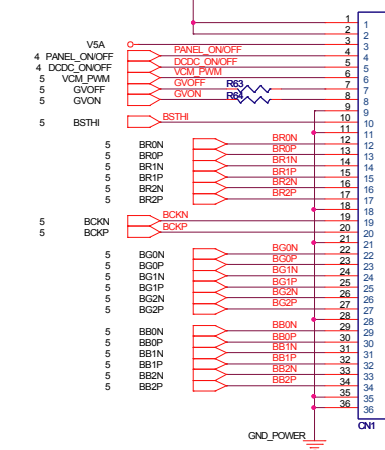
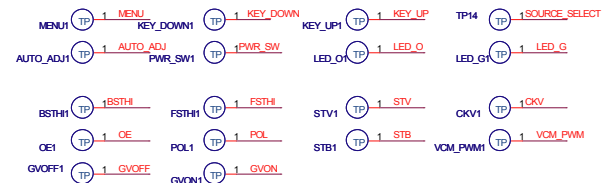
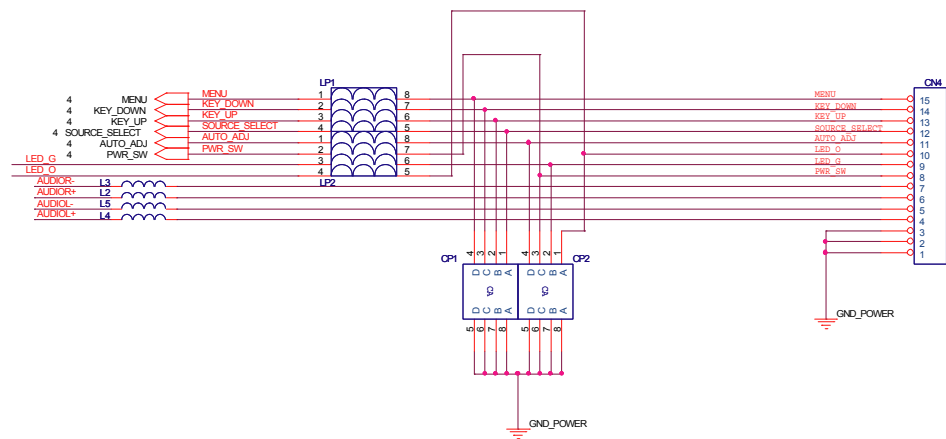
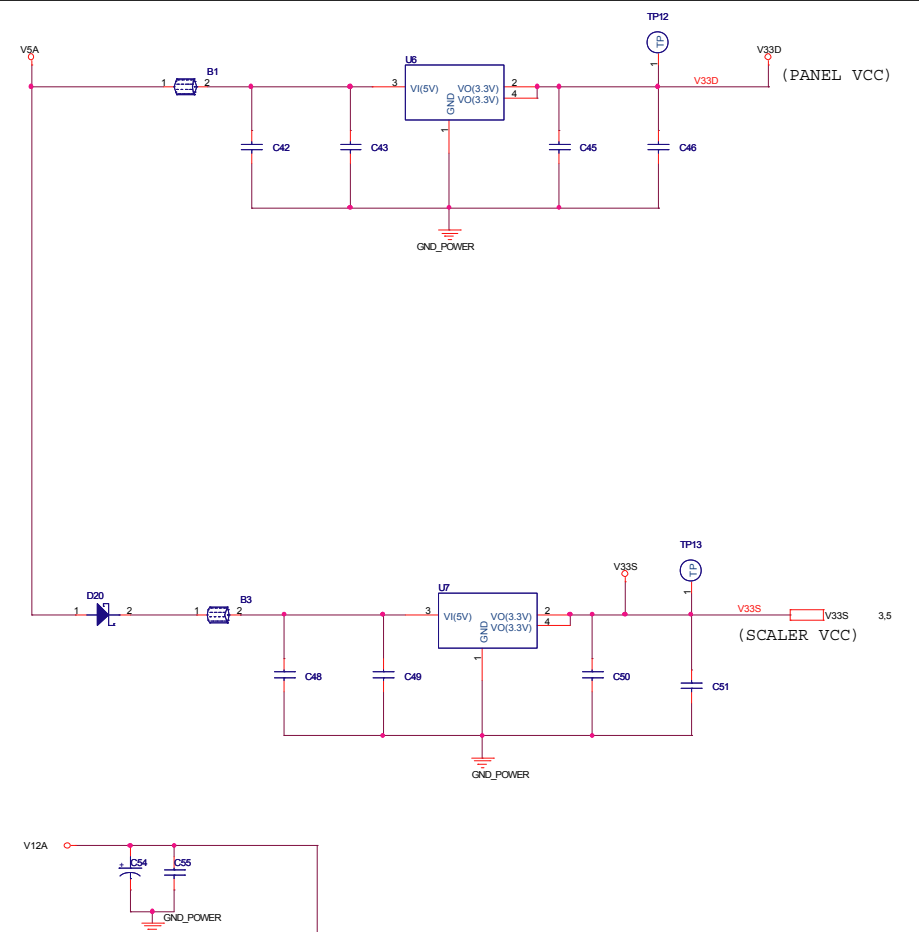
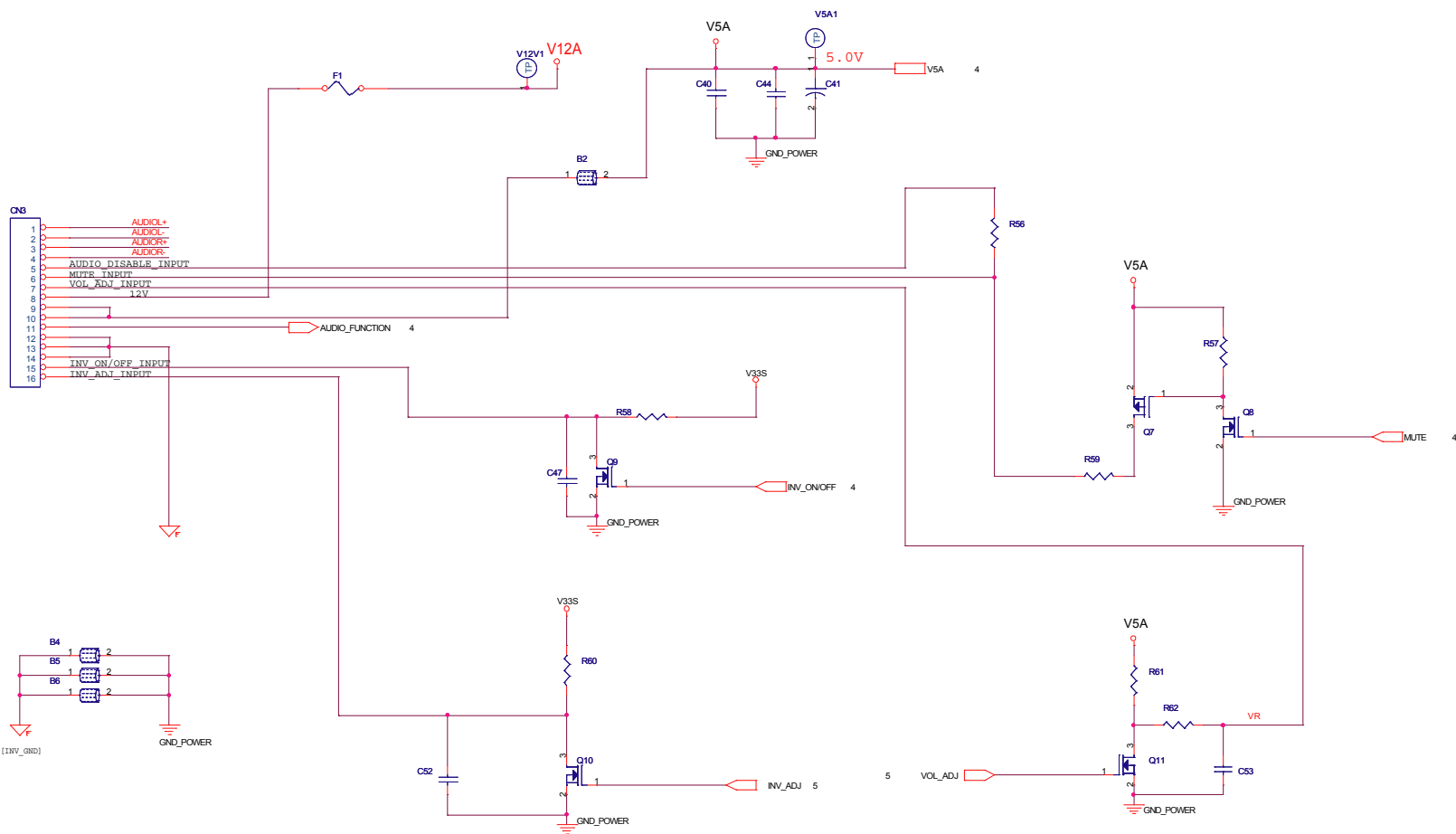


ViewSonic Corporation		
Model		
Title	DVI	
Date		Rev:



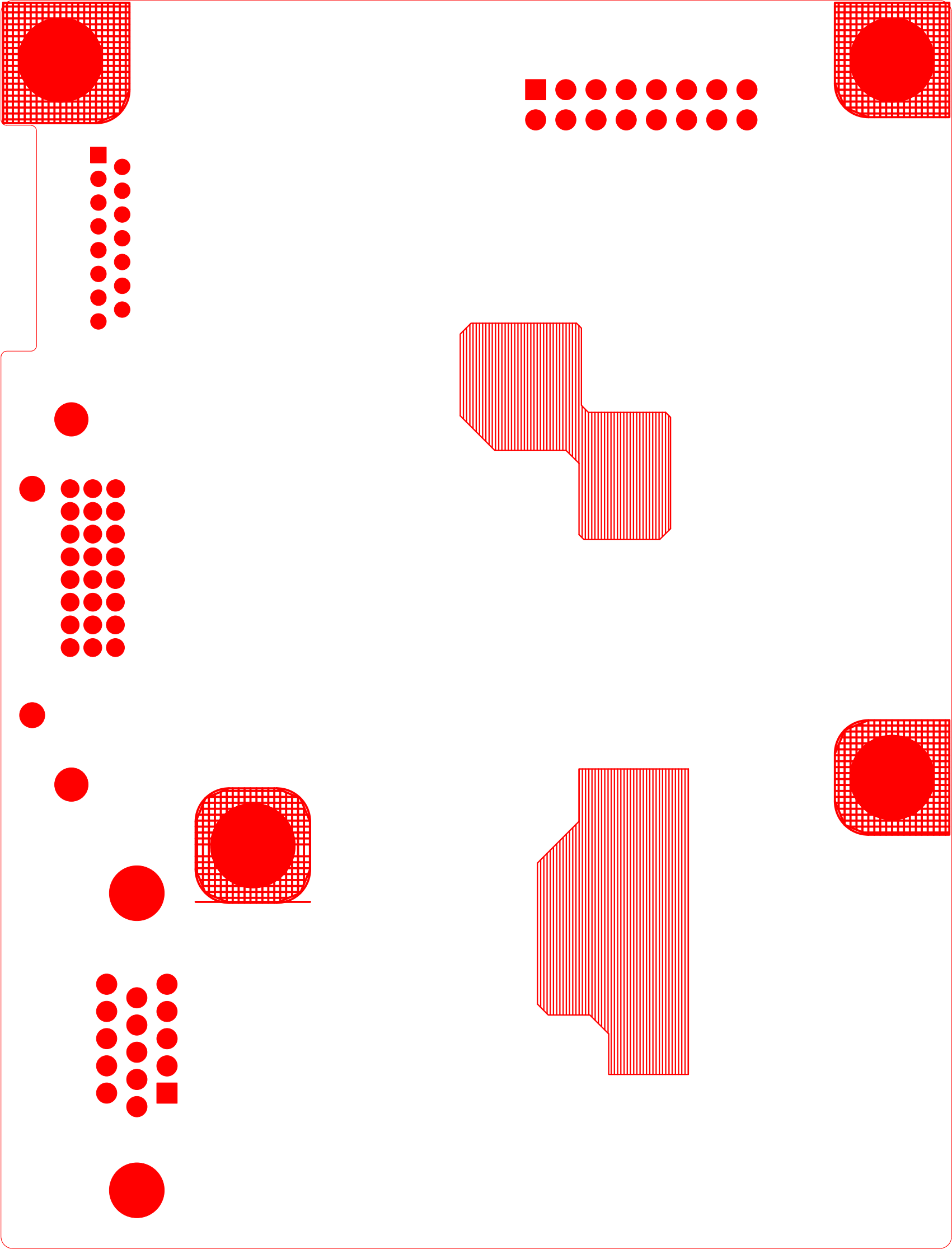
ViewSonic Corporation		
Model		
Title	MCU	
Date		Rev:



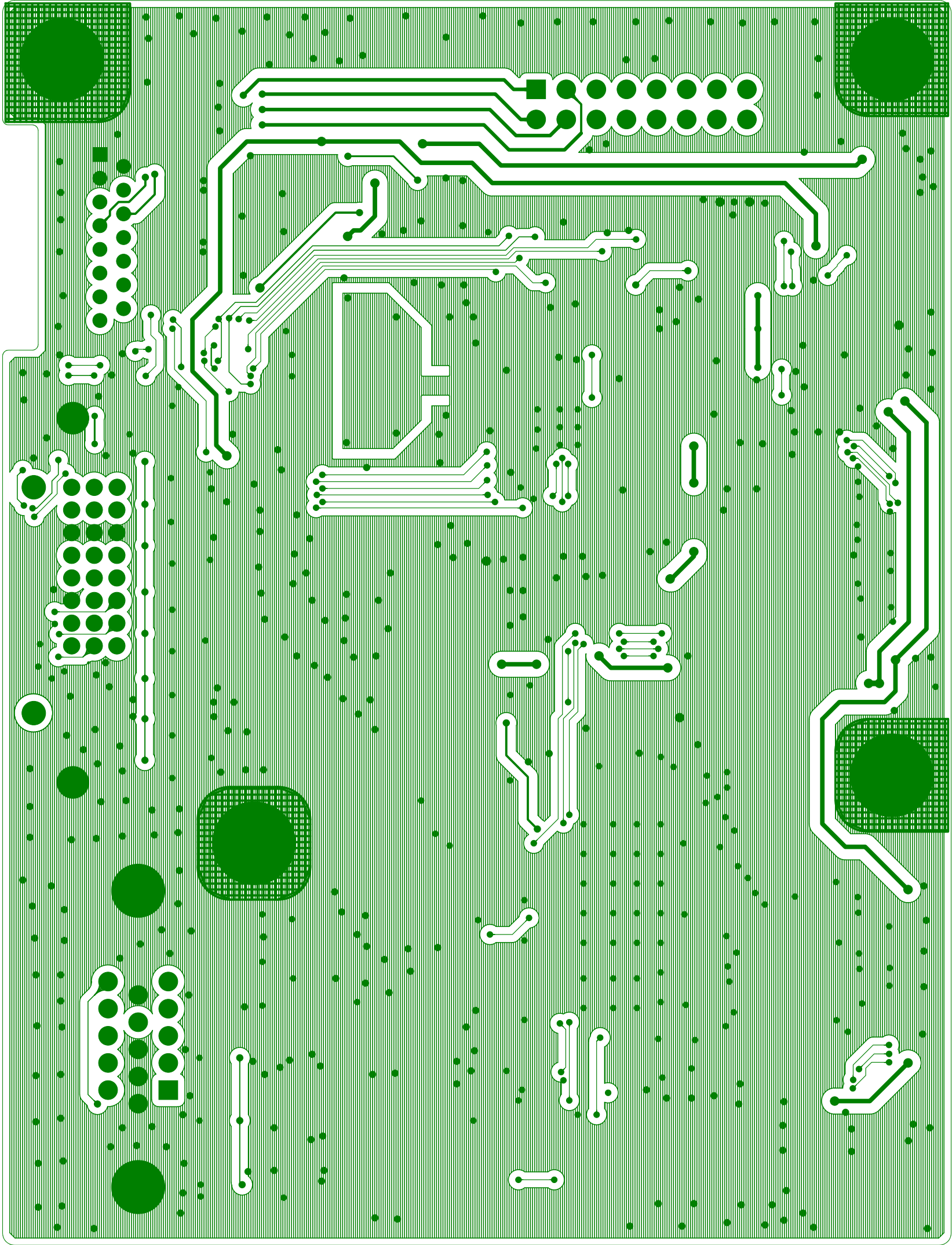


ViewSonic Corporation		
Model		
Title	I/F	
Date		Rev:

Solder Mask Bottom

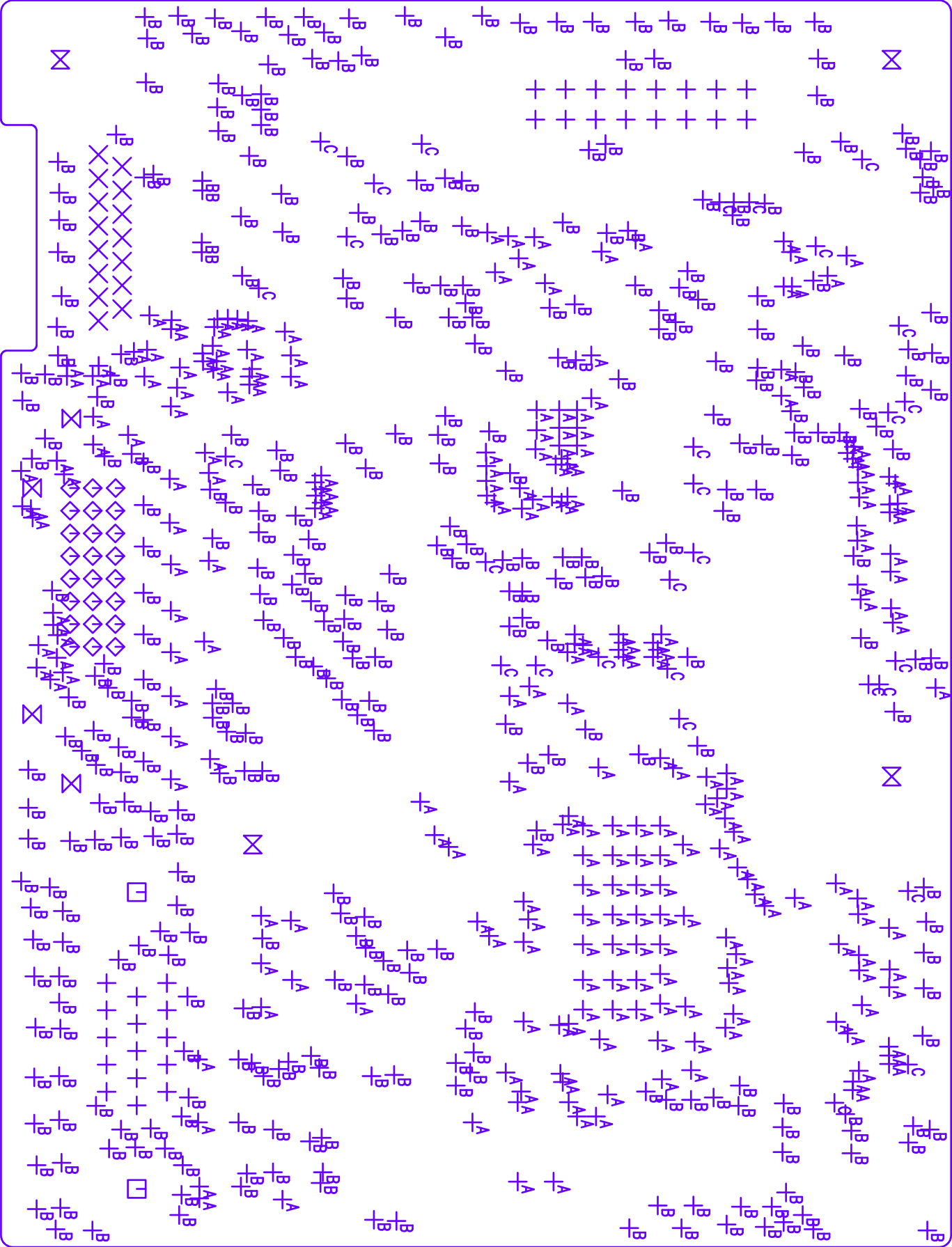


Bottom

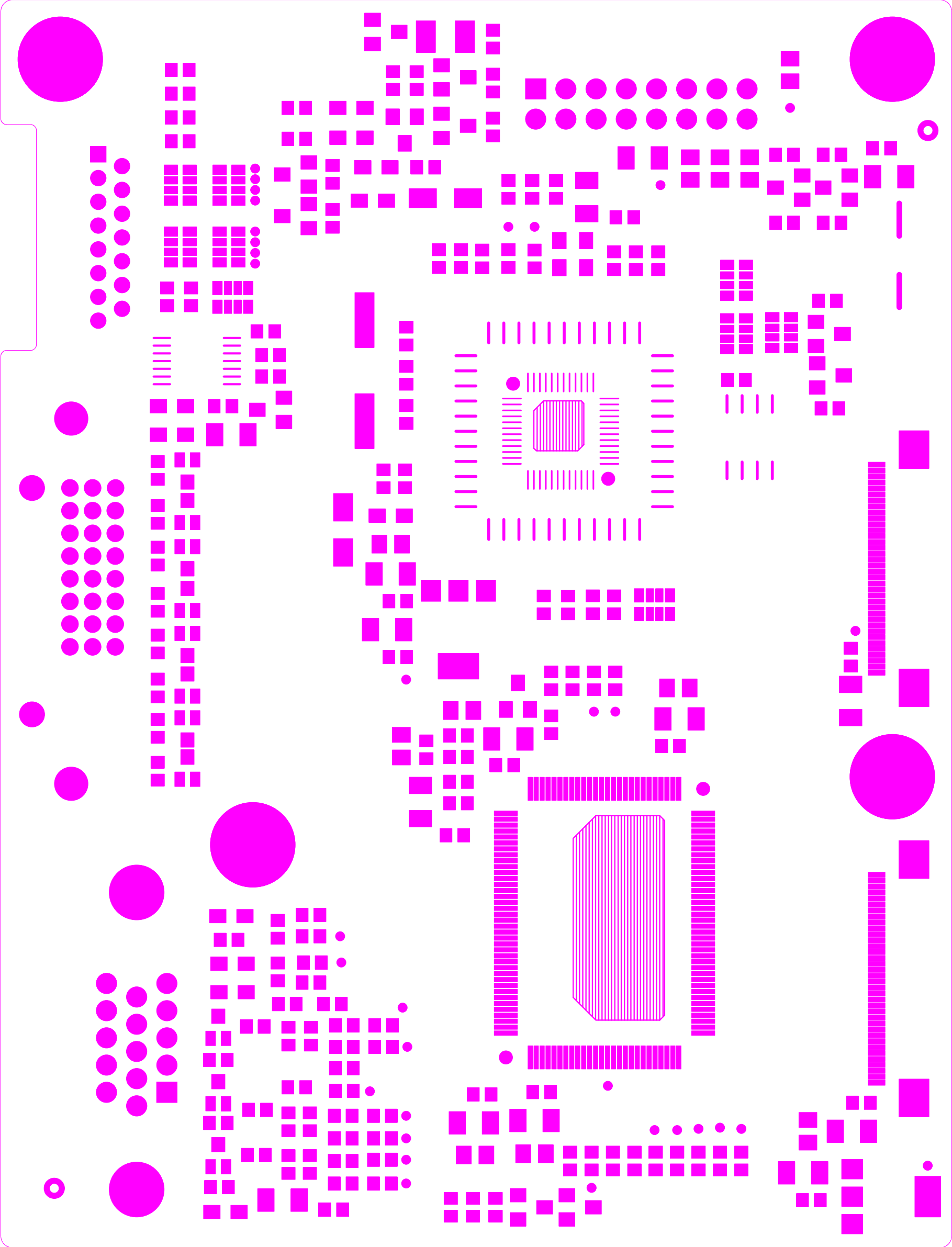


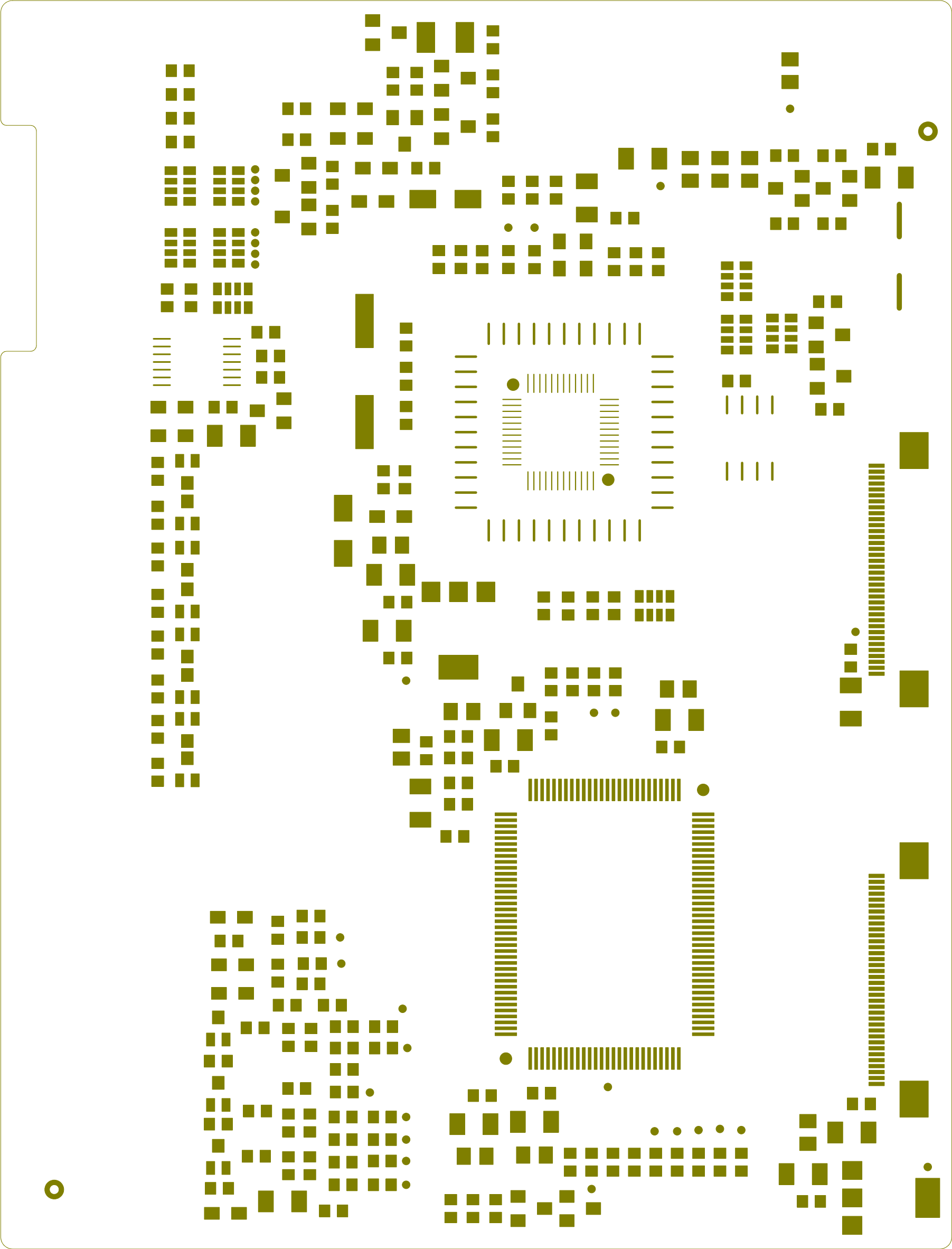
Σ Iεdb J

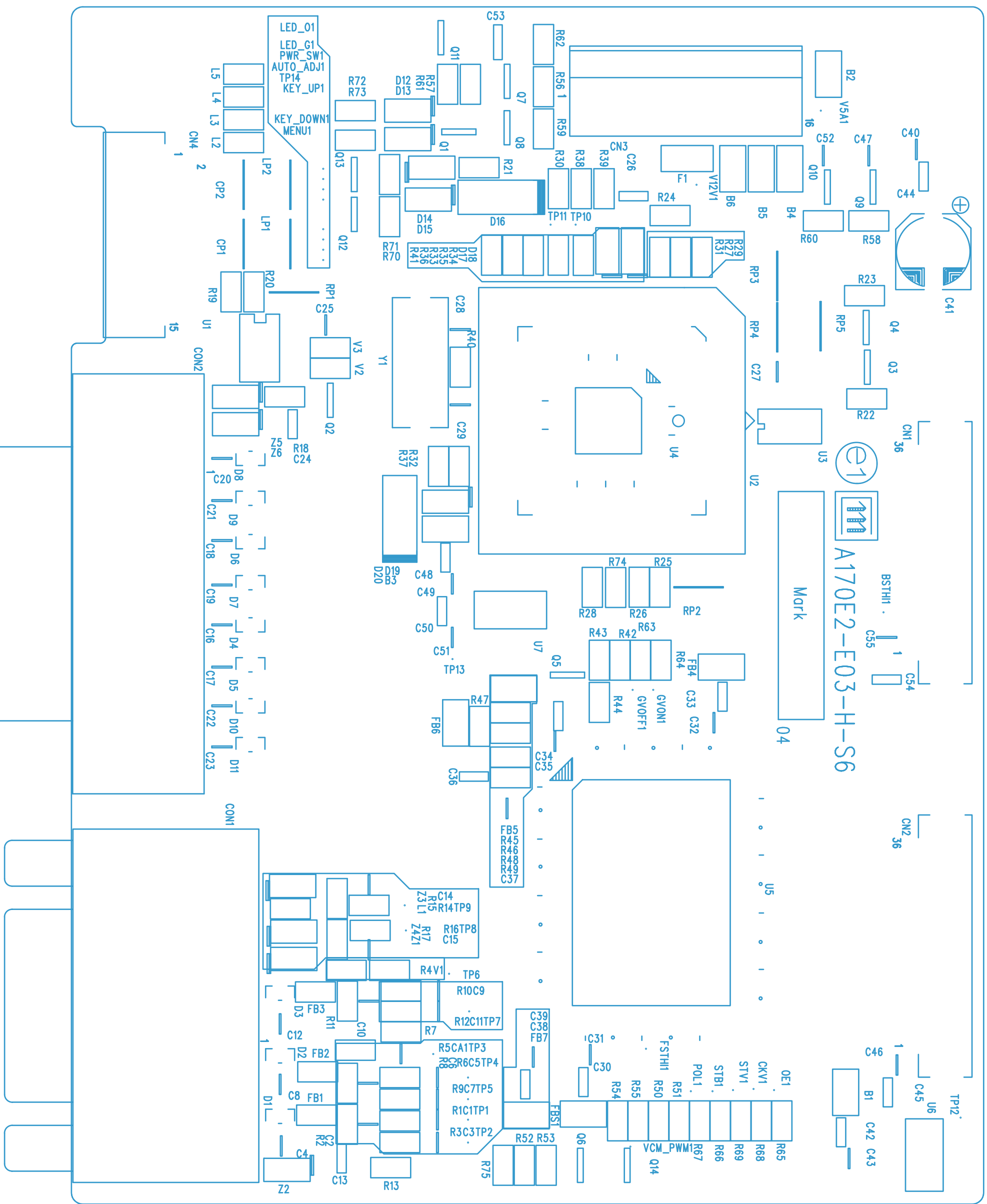
Drill Drawing

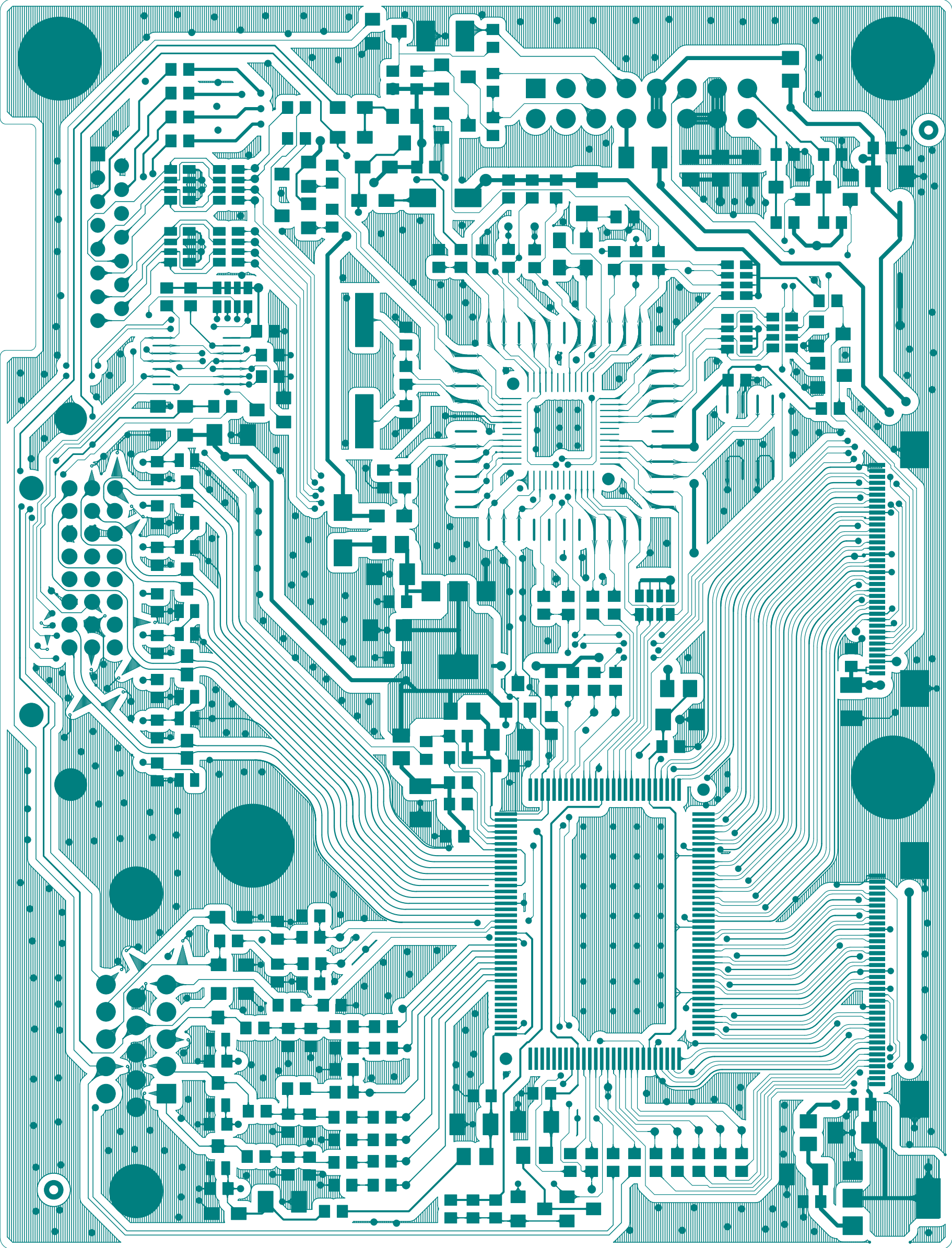


SIZE	QTY	SYM	PLTD
1	31	+	PLTD
0.7	15	×	PLTD
3	2	▮	PLTD
0.9	24	◊	PLTD
1.93	4	⊗	PLTD
4.3	4	⊗	PLTD
0.25	258	A	PLTD
0.3	378	B	PLTD
0.4	29	C	PLTD









*** Reader's Response***

Dear Readers:

Thank you in advance for your feedback on our Service Manual, which allows continuous improvement of our products. We would appreciate your completion of the Assessment Matrix below, for return to ViewSonic Corporation.

Assessment

A. What do you think about the content of this Service Manual?

<i>Unit</i>	<i>Excellent</i>	<i>Good</i>	<i>Fair</i>	<i>Bad</i>
1. Precautions and Safety Notices				
2. Specification				
3. Front Panel Function Control Description				
4. Circuit Description				
5. Adjustment Procedure				
6. Troubleshooting Flow Chart				
7. Recommended Spare Parts List				
8. Exploded Diagram and Exploded Parts List				
9. Block Diagrams				
10. Schematic Diagrams				
11. PCB Layout Diagrams				

B. Are you satisfied with this Service Manual?

<i>Item</i>	<i>Excellent</i>	<i>Good</i>	<i>Fair</i>	<i>Bad</i>
1. Service Manual Content				
2. Service Manual Layout				
3. The form and listing				

C. Do you have any other opinions or suggestions regarding this service manual?

Reader's basic data:

Name:		Title:	
Company:			
Add:			
Tel:		Fax:	
E-mail:			

After completing this form, please return it to ViewSonic Quality Assurance in the USA at facsimile 1-909-839-7943. You may also e-mail any suggestions to the Director, Quality Systems & Processes (marc.maupin@viewsonic.com)